Gender and self-harm in community-based adolescents: relationships with emotional distress, coping and personality

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Abstract

This study aimed to explore the differential relationships between established psychological correlates of deliberate self-harm (DSH) in male and female community-based adolescents with a history of DSH. 162 males (average age = 18.07 years, SD = 1.87) and 402 females (average age = 17.80 years, SD = 1.87) from secondary schools, colleges and universities, completed a self-report questionnaire assessing factors associated with DSH (i.e. attachment, emotional distress, personality and coping). 41 per cent of the total sample (32 per cent of females and 9 per cent of males) reported engaging in DSH in the past year. Path analysis in the female sample revealed a direct relationship between emotional distress and DSH, which was fully mediated by non-productive coping and behavioural inhibition and to a lesser extent by adaptive coping. This model was not supported in the male sample. However, an alternative model in males also showed a direct effect of emotional distress upon DSH, which was fully mediated by impulsivity and anxiety, and to a lesser extent by adaptive coping, and strengthened by a correlation with maladaptive coping (i.e. behavioural inhibition, non-productive coping and pro-social coping). These findings further illustrate the gender differences in factors associated with self-harming behaviour, which may have relevance to clinical prevention and intervention approaches.

Declaration of Authorship

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself. I declare that this thesis is my own work and composition.

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Chapter 1: Introduction

1.1 The nature of deliberate self-harm

1.1.1 Definition and terminology

Deliberate self-harm (DSH) is a commonly used label within the United Kingdom to describe all acts of intentional self-poisoning and self-injury, regardless of underlying motivation or intent, but not including the stereotypic self-injury typically seen in individuals with developmental and intellectual disabilities and acute psychosis (Hawton *et al.,* 2006). This description is consistent with the current World Health Organisation definition of self-harm, 'an act with a non-fatal outcome, in which an individual deliberately initiates a non-habitual behaviour that, without intervention from others, will cause self-harm, and which is aimed at realising changes which the subject desired via the actual or expected physical consequences' (Platt, 1992). Implicit within these definitions is the recognition that this behaviour is a general expression of personal distress.

The over-inclusiveness of the DSH description is with reference to the fact that suicidal intent is considered a continuous rather than a dichotomous phenomenon which, if present, can coexist with multiple alternative motivations, such as emotion regulation or punishment of the self (Harriss *et al.,* 2005; Hawton & Harriss, 2008). Studies of DSH in clinical and non-clinical populations can therefore include suicidal self-harmers, self-harmers without suicidal intent, or an indefinable mixture of both (Klonsky, 2006; Nock & Kessler, 2006). Recent research has attempted to make distinctions between the former groups by measuring more thoroughly the underlying motivations and intents of self-harm (Klonsky & Olino, 2008). Evidence suggests that suicidal intent is low in early adolescent self-harmers and repeat hospital presenting self-harmers, and frequently unclear across self-harming population based studies (Harriss *et al.,*

2005; Hawton & Harriss, 2005; Hjelmeland *et al.,* 1998). Moreover, motivations are typically complex and overlapping and may vary across self-harming episodes (Klonsky, 2006). The types of self-harming methods used can also vary across individuals, and studies often apply different criteria for self-harm behaviour, ranging from no behaviour description to the mildly injurious (e.g. skin picking, biting, hitting), moderately injurious (e.g. punching, scratching, self-cutting), and severely injurious behaviours (e.g. self-poisoning, hanging, jumping from cars). The label 'deliberate self-harm' (DSH), in its current usage, reflects this ambiguity and will therefore be used with the same meaning throughout this thesis. However, use of this exact terminology may not currently be appropriate in clinical practice[1].

1.1.2 Epidemiology

The incidence of deliberate self-harming behaviour appears to rise in early adolescence (11-12 years), peak in the mid-teens (15-19 years), and then decline on entry to early adulthood (> 24 years) (Camelot-Foundation, 2006; Hawton *et al.,* 2006; Lewinsohn *et al.,* 2001). Adolescence is therefore a period of great significance with respect to the initiation of self-harming behaviour and has the highest prevalence rates for such behaviour. Moreover, whilst evidence suggests that the rate of 'fatal' deliberate self-harm increases with age, and is greater in males than in females, evidence from hospital and community-based studies suggests that females are one and a half to two times more likely than males to engage in non-fatal deliberate self-harm (Beautrais, 2002; Hawton & Harriss, 2008). Prevalence rates will be discussed more fully in Chapter 2.

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[1] NICE guidelines for the management of self-harm in the NHS recommend usage of the term 'self-harm' without 'deliberate', in recognition of the offence caused to self-harmers who act during dissociative states and hence without conscious, deliberate intent (NICE, 2004).

1.2 Models of deliberate self-harm (DSH)

A number of models seeking to explain the function of DSH have been considered within the literature. Suyemoto's (1998) review outlined six prevalent models of DSH: (1) environmental (e.g. the role of the environment as a maintainer and initiator of DSH); (2) anti-suicide and (3) sexual (e.g. from a psychoanalytic perspective, that DSH acts as an expression of and control over life and death drives, and sexual drives); (4) boundaries (e.g. from an object relations perspective, where DSH acts as a defining of the boundaries of the self in relation to others when faced with the threat of abandonment); (5) Affect regulation, and (6) dissociation (e.g. DSH serves to express, avoid or regulate overwhelming or uncomfortable emotions). The authors concluded that of the six models, affect regulation and boundaries theories had received the strongest empirical support, suggesting that self-harmers most frequently report motivation for self-harm to be a need for escape from, management of and control over feelings, people and situations (McAuliffe *et al.,* 2007; Suyemoto, 1998; Suyemoto & MacDonald, 1995). Importantly, all models do share this fundamental notion of DSH as a means of escaping, managing, controlling, and regulating uncomfortable emotional states (Chapman *et al.,* 2006).

1.2.1 The Experiential Avoidance Model

Chapman, Gratz and Brown's (2006) Experiential Avoidance Model (EAM), attempts to encapsulate the common theme of previous models of deliberate self-harm- i.e. DSH as a means of escape from and management or control of unwanted emotional states induced by internal, inter-personal or situational circumstances (Chapman *et al.,* 2006) (see Figure 1). Experiential avoidance is therefore conceptualised as a set of behaviours or responses that perform the latter function. Chapman *et al.* (2006) propose that DSH (in the absence of any intent to die) is maintained by the emotional and behavioural 'avoidance' of undesirable emotional experiences, and that such avoidance is an underlying tendency fuelled by high emotion intensity, poor distress tolerance and ineffective self-regulation skills (i.e. those external and internal processes responsible for the monitoring,

evaluating and modifying of emotional and behavioural reactions) (Chapman *et al.*, 2006). This theory is consistent with an aspect of Nock and Prinstein's (2004) functional model of self-mutilative behaviour, which describes an automatic negative reinforcement function of self-harm (i.e. to stop unwanted emotions) (Nock & Prinstein, 2004; Nock & Prinstein, 2005).

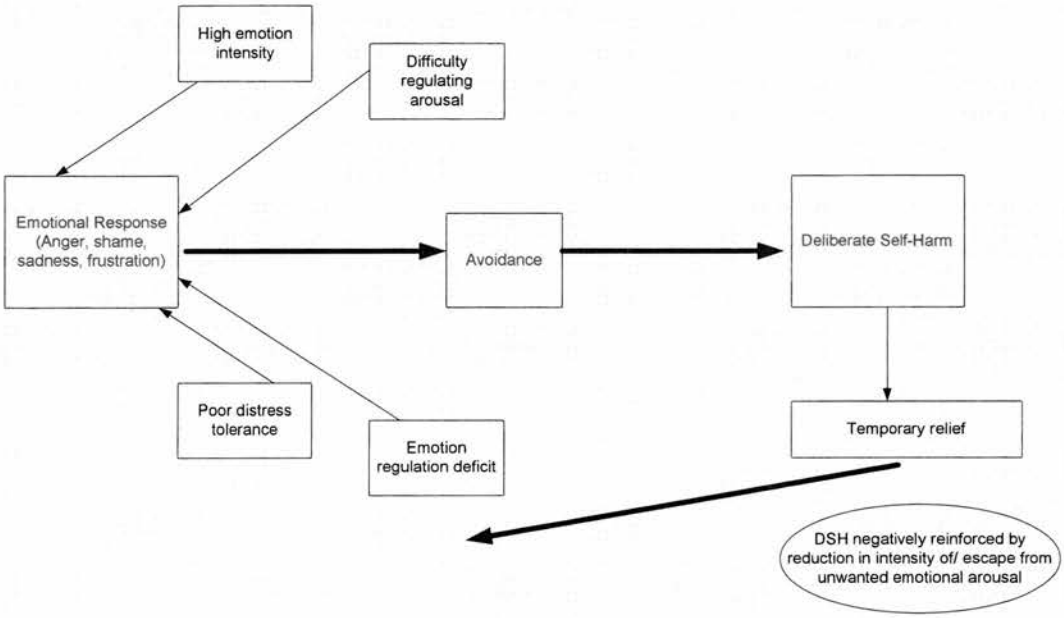

Figure 1: The Experiential Avoidance Model (EAM) of Deliberate Self-Harm
Reproduced from Chapman, Gratz & Brown (2006), Solving the Puzzle of Deliberate Self-Harm

Emotion regulation skills could be further defined as (1) the ability to correctly identify, comprehend and accept emotions; (2) the ability to inhibit impulses in response to uncomfortable emotions and instead engage in non-mood-dependant goal directed behaviours; (3) the usage of effective (and appropriate) strategies to cope with and regulate emotional discomfort, rather than avoiding such emotions, and (4) the ability to incorporate uncomfortable emotional experience into everyday life (Chapman *et al.,* 2006; Gratz, 2007; Gratz & Roemer, 2004).

Hayes *et al.* (1996) define experiential avoidance as a phenomenon 'that occurs when a person is unwilling to remain in contact with particular private experiences (e.g. bodily sensations, emotions, thoughts) and takes steps to alter the form or frequency of these events' (Hayes *et al.*, 1996, p1154). This concept has a long history within psychotherapy. Freud referred to the importance of relinquishing defences and the repression of memories and thoughts outwith conscious awareness, while Rogerian client-centred therapy alludes to the need for 'openness to experience' (Hayes *et al.*, 1996). Experiential avoidance is therefore widely recognised as a 'putative pathological process' and links have been shown to exist between emotional avoidance behaviour and psychopathology, including depression, dissociative disorders, obsessive-compulsive disorder, general anxiety disorder, post-traumatic stress disorder and borderline personality disorder (Borkovec *et al.*, 2004; Briere & Gil, 1998; Chapman *et al.*, 2006; Chapman *et al.*, 2005; Gratz, 2006; Hayes *et al.*, 1996).

1.2.1.1 Self- regulation and avoidance

The inability to self-regulate emotional arousal/distress or adverse internal and external states has been proposed as a component in the development of experiential avoidance behaviour, whereby individuals unable to reduce or manage distress will respond by actively avoiding it (Chapman *et al.,* 2006). Carver and Scheier's (1982) model of self-regulation identifies three main components of the self-regulation feedback-loop process: (1) standards; (2) monitoring, and (3) operation (Baumeister & Heatherton, 1996; Carver & Scheier, 1982). 'Standards' are defined as goals and ideals which drive internal states and behaviour, and the absence or conflict of which can hamper effective self-regulation. 'Monitoring' is defined as the process of checking the 'actual' state of the self against the desired or 'goal' state of self, and therefore facilitates self-control. Finally, the 'operate' phase is defined as the process of altering the internal state if monitoring reveals a discrepancy between the 'goal' and the 'actual' self state. Self-regulation is conceptualised as a controlled process and therefore can be used to override habitual and impulsive responses to internal or

external events. Failures in self-regulation can therefore occur at any of the three predefined points (Baumeister & Heatherton, 1996).

1.2.1.2 Coping as a form of self-regulation

Eisenberg *et al.* (1997) defined coping as an aspect of the self-regulation of emotion, cognition and behaviour, which represents the techniques used by individuals, in these domains, to deal with situations of stress (Eisenberg *et al.*, 1997 as cited in Compas *et al.*, 2001). Similarly, Carver *et al.* (1989) have defined coping as the 'constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person' (Carver *et al.*, 1989; Compas *et al.*, 2001). With respect to Carver and Scheier's (1982) model of self-regulation, coping strategies could be conceptualised as part of the 'operation' process of self-regulation, where attempts are made to alter internal states identified as discrepant from the desired internal state (Carver & Scheier, 1982). Much of the coping literature has been influenced by Lazarus and Folkman's (1984) Transactional Model, and therefore coping techniques have historically been classified as emotion focused (e.g. expressing emotion, seeking help/dialogue from others, and avoiding the source of distress) versus problem focused (e.g. seeking information, generating solutions, and acting to change the source of distress) or avoidance focused (e.g. Compas *et al.*, 2001). Compas *et al.* (2001) have also proposed an alternative and less broad two-dimensional model of coping for application with children and adolescents, i.e. (1) voluntary versus involuntary and (2) approach versus avoidance (Compas *et al.*, 2001).

Deficits in self-regulation have been shown to exacerbate emotional distress states. For example, rumination (i.e. the tendency to dwell on negative experiences), has been shown to worsen symptoms of depression and has been linked to impulsive eating behaviours (Nolen-Hoeksema *et al.*, 1994). Similarly, cognitive and behavioural avoidance are known to be maintainers of symptoms in

obsessive-compulsive and other anxiety disorders (Ecker & Gönner, 2008; Nolen-Hoeksema & Girgus, 1994; Nolen-Hoeksema *et al.,* 1994; Wells, 1997).

1.2.1.3 Temperament and avoidance

Chapman *et al.* (2006) further suggest that a tendency for avoidance behaviour may be temperament based. The hypothesised temperament based motivational systems underlying behaviour and emotion, the behavioural inhibition system (BIS) and the behavioural activation system (BAS), are characterised by differing sensitivities to biological systems responsible for the regulation of our responses to external and internal stimuli (Gray, 1987, as cited in Chapman *et al.,* 2006). The BIS employs an 'avoidance' response which is purportedly triggered by unpleasant and threatening stimuli, while the BAS employs an approach response and is sensitive to pleasant and rewarding stimuli.

Factor analytic studies have found that the BAS loads onto an impulsiveness factor that is conceptualised as 'reward sensitivity/drive', which is different from but strongly correlated with another impulsiveness factor typically measured by standard impulsivity scales (e.g. Zuckerman's Sensation-seeking Scales), defined as 'rash, spontaneous impulsiveness' or lack of consideration for consequences (Dawe *et al.*, 2004). The latter impulsivity factor can also be conceptualised as a 'present-needs oriented' as opposed to a 'future oriented' method of problem solving and has been linked to affect dysregulation (Herpertz *et al.,* 1997). An association between 'rash spontaneous' impulsivity, aggression and self-harm has been previously identified in studies of suicidal self-harmers (Gorlyn, 2005; Malone *et al.,* 1995)

Theorists have suggested that individual levels of BIS and BAS activity are predictive of internalising and externalising difficulties respectively (Hundt *et al.,* 2008). Gray (1991) proposed that an overactive BIS predicted anxiety and a depression comorbid with anxiety (i.e. neurotic anxiety), and that an under-active BAS resulted in depression without anxiety, possibly through lack of positive

experiences (Beevers & Meyer, 2002; Gray, 1991 as cited in Hundt *et al.,* 2008). Moreover, it had been proposed that high BAS and/or low BIS activity may be associated with externalising symptoms such as drug and alcohol abuse (Gray, 1991 as cited in Hundt *et al.,* 2008; Kimbrel *et al.,* 2007). Finally, there is some evidence to suggest an association between mania and high levels of BAS, hence an overactive reward sensitivity and drive (Alloy *et al.,* 2008; Depue & Iacono, 1989; Meyer *et al.,* 2001).

Chapman *et al.* (2006) suggest that behavioural inhibition (BIS) may manifest itself as a 'passive avoidance' in response to emotional distress and therefore may increase the likelihood of engagement in DSH. Indeed, evidence has shown an association between BIS and suicidal thinking in undergraduates, mediated by socially prescribed perfectionism (O'Connor & Forgan, 2007). In addition, Chapman *et al.* (2006) propose that 'rash, spontaneous impulsiveness' may increase the likelihood of selecting faster acting but more maladaptive forms of coping to regulate emotional arousal, and therefore may also indirectly impact upon the use of deliberate self-harm as an experiential avoidance technique (Chapman *et al.,* 2006).

1.2.1.4 Attachment and avoidance

The core tenet of attachment theory is that humans have an innate propensity to form affectionate bonds. As a consequence of this propensity, in times of distress a person will seek out an individual perceived as safe, secure and supportive (Bowlby, 1988). Attachment theory further proposes that attachment styles learned through early relational experiences with a caregiver will influence an individual's later style of coping with stressful life experiences. Moreover, evidence suggests an association between attachment styles and later psychopathology (e.g. insecure attachment has been linked to psychological distress) (Main, 1996), and between perceived parental bonding and adolescent mental health (e.g. depression was negatively correlated with perceived parental

care and positively correlated with perceived parental control) (Canetti *et al.,* 1997; Rigby *et al.,* 2007). There is also a suggested link between early rearing environment and BIS, such that BIS may mediate the relationship between an individual's early experience of low control or low care over their environment and psychopathology (Chorpita & Barlow, 1998; Kimbrel *et al.,* 2007). Moreover, one study showed a direct relationship between anxious-attachment and distress in an imaginal high-threat (to a personal relationship) situation, while BIS positively moderated the effect of threat upon this distress in a group of non-clinical female adults. In the presence of these independent effects, BIS and anxious-attachment were also moderately inter-correlated (Meyer *et al.,* 2001). Therefore, in adults, attachment experience in conjunction with BIS may play an important role in a developmental model of deliberate self-harm behaviour.

1.3 Psychological risk factors for deliberate self-harm

A wide range of psychological risk factors for deliberate self-harm has been investigated and identified in both clinical and non-clinical populations (Evans *et al.,* 2004; Jacobson & Gould, 2007; Portsky & van Heering, 2007; Webb, 2002). With respect to adolescent populations there have been three major reviews of the literature. Evans *et al.* (2004) reviewed studies of 12-20 year olds conducted between 1971 and 2000, examining risk factors for suicidal and non-suicidal deliberate self-harm and suicidal ideation in population based adolescents. Jacobson and Gould (2007) reviewed 22 studies of only non-suicidal deliberate self-harm in children and adolescents from both clinical and community-based populations (no age range or study time periods reported). Finally, Webb (2002) reviewed 11 studies conducted between 1990 and 2000, examining psychosocial and psychological risk factors in both suicidal and non-suicidal deliberate self-harming adolescents (no age ranges reported).

Evidence from these reviews and additional studies suggests that depression is directly and robustly associated with self-harm behaviour in community-based

and hospital presenting adolescents (Evans *et al.,* 2004; Hawton & Fagg, 1992). However, data from other studies suggest that adolescent self-harmers report high levels of depressive symptoms rather than sustained depressive disorder, and in some cases there have been no noted differences in levels of depression relative to non-self-harming adolescents (Harrington, 2001; Jacobson *et al.,* 2008). Instead, a significantly greater likelihood of depression has been reported in suicidal versus non-suicidal self-harming adolescent out-patients (Jacobson *et al.*, 2008). The outcomes of the reviews are therefore, likely attributable to samples containing self-harmers of mixed intent (i.e. suicidal and non-suicidal intentions). Anxiety, hopelessness and low self-esteem have also been shown to be associated with self-harm in adolescents. However, studies suggest this may be reflective of their comorbidity with depression, and when depression is controlled for the relationship with anxiety and self-esteem is no longer present (Evans *et al.,* 2004; Gould *et al.,* 1998).

No reference was made to impulsivity in either the Evans *et al.* (2004) or Jacobson and Gould (2007) systematic reviews. However, Webb's (2002) review reported that in a study of hospital presenting self-harmers versus community and psychiatric controls, only measures of impulsivity distinguished the two groups after controlling for depression, and this was significantly correlated with problem solving ability (Kingsbury *et al.*, 1999, as cited in Webb, 2002). Greening *et al.* (2007) also suggest that poor impulse control in childhood and adolescence can lead to aggression, anti-social behaviour, inter-personal difficulties and eventually depression, and therefore propose that the relationship between impulsivity and suicidal behaviour is an indirect one (Greening *et al.,* 2007). Similarly, a significant but low association ($r = 0.35$) between impulsivity and suicidality was demonstrated in adolescent psychiatric inpatients, suggesting that impulsivity had only a small or indirect influence on suicidal behaviour (Horesh *et al.,* 1999). Conduct disorder and anti-social behaviour, which share some features of difficulties in impulse control, have also been shown to be significantly associated with self-harming behaviour (Evans *et al.,* 2004; Jacobson & Gould, 2007).

Jacobson and Gould (2007), but not Evans *et al.* (2004), list alexithymia (i.e. difficulty interpreting one's emotional state) and dissociation (i.e. emotional avoidance) as more prevalent in adolescents who self-harm than those who do not. Similarly, in a systematic review of twenty two studies exploring the coping strategy of social problem solving in adolescents, results suggested deficits in suicide attempters relative to non-attempters. However, these differences in social problem-solving did not remain significant after controlling for hopelessness and depression (Speckens & Hawton, 2005). There is also evidence to suggest a strong link between attachment style and emotion regulation skills (Mikulincer *et al.*, 2003; Wilkinson & Walford, 2001), and a recent study identified emotion regulation as a mediating factor between attachment style and DSH in undergraduates, thus supporting the hypothesis that poor attachment relationships may interfere with a child's acquisition of effective emotion regulation strategies, leading to the adoption of less effective coping alternatives such as DSH (Gratz, 2006; Kimball & Diddams, 2007; Yates, 2004). This study demonstrated that family function (i.e. being separated from both parents early in life), sexual and physical abuse, were shown to be directly associated with DSH in adolescents, and therefore identified as putative vulnerability factors for DSH. Current family discord and quality of emotional relationships with parents were also described as risk factors for self-harming behaviour in adolescents (Evans *et al.*, 2004; Webb, 2002).

The array of psychological correlates of DSH suggests a complex interplay of distal and proximal internal and external stressors and vulnerability factors. Further research is therefore required to identify the relationships between these correlates and their combined effects on deliberate self-harm.

1.4 Gender differences in psychopathology in adolescence

As previously stated, the available data support the notion that DSH increases in early adolescence and peaks in mid to late adolescence. This pattern appears to

parallel that seen in internalising disorders such as anxiety and depression, and externalising behaviours such as delinquency and substance abuse in adolescence (Steinberg, 2005). Such disorders have previously been identified as psychological risk factors for deliberate self-harm in adolescents.

Adolescence or youth is a transitional life period marked by significant changes in biological, psychological and social development, sometimes described as a period of 'storm and stress' (Cicchetti & Rogosch, 2002). Global social trends suggest that puberty now begins earlier than in previous generations, but that the leaving of higher education and the parental home, entry into the workforce and marriage, occur far later, especially in the west. The transitional period of adolescence could therefore be understood as currently encompassing young people from between the ages of 12 and 24 years old (UNPFA, 2008).

Difficulties during this period are a common, though not necessarily inevitable condition of puberty and adult development. Emotional distress in adolescence that significantly impacts upon day-to-day functioning is prevalent in approximately 15-20 per cent of the adolescent population, and is reflected in the high rates of externalising and internalising behaviours in this age group (Offer & Schonert-Reichl, 1992). Achenbach *et al.* (1991) described internalising as the directing inwards of emotional difficulties resulting in symptoms of depression, anxiety, disordered mood and withdrawal. Externalising, on the other hand, is defined as the turning outwards of emotional difficulties thus apparent as delinquency, anti-social behaviour, aggression, impulsivity and hyperactivity (Achenbach, 1991). In a recent study, adolescents with internalising difficulties (as measured using the Youth Report Scale) were shown to use cognitive regulation strategies of self-blame and rumination more frequently than adolescents with externalising problems. Cognitive regulation strategies also explained more of the variance associated with internalising than externalising problems. Indeed, there were no cognitive regulation strategies which externalisers used significantly more frequently than internalisers, and the only

predictor of externalising problems was 'positive refocusing' or reverting to thoughts about other more pleasant events. This suggests that event focused cognitive strategies are more robustly related to internalising, while event avoidant strategies are more related to externalising disorders (Garnefski *et al.,* 2005).

The lifetime prevalence of internalising disorders, such as depression and anxiety, in females is twice that seen in males, and adolescent girls are more likely to experience depression and anxiety than adolescent boys (Hyde *et al.,* 2008; Lewinsohn *et al.,* 1998; Nolen-Hoeksema, 2001). In both disorders onset for females is far earlier than for males. Both cross-sectional and longitudinal studies suggest that gender differences in depressive disorders emerge between the ages of 13 and 15 years old, with the largest increases occurring between 15 and 18 years old (Hankin *et al.,* 1998; Nolen-Hoeksema & Girgus, 1994). Other evidence suggests that while depressed adolescent females experience more typical features of depressive disorder than depressed males (e.g. body dissatisfaction, guilt, self-blame, self-disappointment and sad mood), both groups experience equivalent levels of occupational and social dysfunction (Bennett *et al.,* 2005; Hankin *et al.,* 1998; Piccinelli & Wilkinson, 2000). Conversely, males are overrepresented in externalising disorder categories (e.g. conduct disorder, anti-social personality disorder and substance abuse), and young depressed males have been shown to be more likely than females to report alcohol and substance abuse problems, leaving school without qualifications and long periods of unemployment (Fergusson & Woodward, 2002). Lewinsohn *et al.* (1998) report that female anxiety disorders are not wholly accounted for by associated psychosocial factors such as major life stress, daily hassles, self-esteem, coping skills and family and social support. Like Nolen-Hoeksema (2001), the authors suggest that both anxiety and depression share underlying psychological correlates, and that gender differences in cognitive responses to stress (e.g. a female tendency to ruminate and a male tendency to use distraction), may better

explain prevalence rates (Lewinsohn *et al.,* 1998; Nolen-Hoeksema, 2001; Nolen-Hoeksema & Girgus, 1994).

Gender differences have also been reported in adolescent coping responses to stress. Specifically, females have shown greater usage of social support seeking, rumination and problem focused coping than males, whilst males have reported greater use of avoidant coping strategies (Ce *et al.,* 2006; Eschenbeck *et al.,* 2007). However, several studies also report no such gender differences in coping styles (Hamilton & Fagot, 1988; Vingerhoets & Van Heck, 1990).

Investigation of gender differences in adolescent psychopathology has only recently begun to overlap with investigation of gender differences in prevalence rates in DSH. However, there is a lack of consensus in the literature as to the reason for such differences and where, if indeed anywhere, aetiological differences might lie.

1.5 Explaining the gender differences in deliberate self-harm (DSH)

The 'gender paradox' in deliberate self-harm could be described as the unexplained higher prevalence rate of non-fatal deliberate self-harm in females relative to males, which is somewhat paradoxical given the higher rate of suicide in adult males relative to females. Various explanations for the 'gender paradox' in DSH have been proposed (see Canetto & Sakinofsky, 1998; Wichstrom & Rossow, 2002). Firstly, given the greater rates of completed suicide in males relative to females, some studies suggest that the lethality of methods used by males may account for the gender difference in overall self-harm prevalence rates. However, this fails to explain why females engage in more non-fatal deliberate self-harm in general (Wichstrom & Rossow, 2002). Secondly, it has been suggested that reliance on the recruitment of clinical or hospital based populations has resulted in a greater proportion of help seeking females and therefore greater prevalence rates in females relative to males. However, recent studies in

community-based populations have shown similar prevalence rates (Hawton *et al.,* 2002; Patton *et al.,* 2007). Canetto and Sakinsofsky (1998) propose instead that cultural socialisation makes non-fatal suicidal behaviour in males less acceptable than in females due to being an overt expression of helplessness and distress, and thus males may feel disinclined to report engagement in such behaviour (Canetto & Sakinofsky, 1998). However, given the anonymous nature of the majority of self-harm surveys in use, others speculate that this cannot wholly account for the gender differences in prevalence rates (Wichstrom & Rossow, 2002). Finally, and most compellingly, theorists suggest that biological and cultural socialisation differences between males and females may account for some of the gender differences in self-harming behaviour, factors also thought to underlie the gender difference in prevalence of internalising disorders such as depression and anxiety.

There are as yet no published systematic reviews of the literature exploring gender differences in psychological factors associated with deliberate self-harm in community-based adolescents. This is an important population, because a preponderance of literature has tended to focus on self-harming behaviour in clinical and hospital presenting adults, the results of which are not directly generalisable to community-based adolescents. Such a review was therefore conducted for the purposes of this thesis, and is included in Chapter 2.

Chapter 2: Literature Review

A systematic search and narrative review of gender differences in psychological factors associated with Deliberate Self-Harm (DSH)

2.1 Aim

To conduct a systematic search and narrative review of the literature to identify gender differences in psychological factors associated with DSH in community-based adolescents (i.e. young people between the ages of 12 and 24 years old).

2.2 Methods

2.2.1 Identification of relevant studies

A literature search of the following databases was conducted: (January 1993-March 2008) CINAHL Plus; MEDLINE; PsycArticles; Educational Administration Abstracts and PsycInfo. The reference sections of identified journal articles and review papers were also searched for relevant studies. The search terminology was as follows (* indicates truncation): (Self-destruct* or self-harm* or self-cut* or self-poison* or self-injur* or self-mutilat* or parasuicid* or suicidal behav* or suicidality) and (teen* or adolescent* or youth or young-people or child* or school or college).

2.2.2 Inclusion and exclusion criteria

Articles were included in the review if they met the following criteria: 1) Published between January 1993 and March 2008; 2) Non-clinical general population (community) based sample of adolescents aged between 12 and 24 years old; 3) Quantitative questionnaire based study; 4) Included at least one DSH measure and at least one psychological measure. Articles were excluded from the review based on the following criteria: 1) English full text articles were not available; 2) Study samples comprised in or out-patients; hospitalised, clinically referred or incarcerated participants; participants with developmental/intellectual disabilities or psychiatric diagnoses, and participants of cultural, ethnic or sexual

minorities; 3) Participant samples comprised only 'suicidal ideators' or combined 'suicide attempters' with 'ideators without attempts' into one group.

2.3 Preliminary results

2.3.1 Search results

4024 articles were retrieved from CINAHL Plus, MEDLINE, PsycArticles and Educational Administration Abstracts. 5217 were retrieved from PsycInfo, with considerable overlap across databases. Backward referencing of full text articles was also used, of which two additional papers were identified. Based on abstracts, 220 papers were considered suitable for inclusion and their full texts accrued. Of this selection, 113 studies were removed following application of exclusion criteria, and/or failure to meet all inclusion criteria, and a paper being a short report unavailable in an expanded format (Fekete *et al.,* 2004). In addition to this, four large scale studies each had two published papers, hence these were included as four instead of eight papers (Fergusson *et al.,* 2003; Fergusson & Lynskey, 1995a, 1995b; Fergusson *et al.,* 2000; Liu & Tein, 2005; Liu *et al.,* 2005; Wichstrom, 2000; Wichstrom & Rossow, 2002). One further paper was excluded because the method of identification of DSH was not directly comparable to that used by other studies (O'Sullivan & Fitzgerald, 1998).

2.3.2 Further exclusion criteria

The remaining 102 full text articles were then re-checked for gender comparisons on psychological factors associated with self-harm. A total of 27 papers were excluded due to containing female or male only samples, too few of one gender to allow for adequate gender comparison or having not conducted any gender comparisons (e.g. between group, within group comparisons then described qualitatively, or gender as a predictor in a regression analysis) (Armey & Crowther, 2008; Brown *et al.*, 1999; Connor & Rueter, 2006; Croyle & Waltz, 2007; Favaro *et al.*, 2007; Fergusson *et al.*, 2003; Fergusson & Lynskey, 1995a,

1995b; Fergusson *et al.*, 2000; Glassman *et al.*, 2007; Goodwin & Marusic, 2003; Gratz, 2006; Gratz & Roemer, 2008; Haavisto *et al.*, 2005; Hilt *et al.*, 2008; Kimball & Diddams, 2007; Klonsky & Olino, 2008; Lester, 1998; Martin *et al.*, 2005; Murray *et al.*, 2008; Murray *et al.*, 2005; Nock & Mendes, 2008; Paivio & McCulloch, 2004; Polk & Liss, 2007; Portzky *et al.*, 2007; Rosow *et al.*, 2007; Rubenstein *et al.*, 1998; Unikel *et al.*, 2006; Wedig & Nock, 2007; Weierich & Nock, 2008). Therefore 75 papers were considered suitable for inclusion in the review. Of these papers, 43 per cent (N=32) was from the USA, 25 per cent (N=19) was from the UK & Europe, 13 per cent (N=10) was from Australia and New Zealand, 8 per cent (N=6) was from Canada, 8 per cent (N=6) was from Asia, and 3 per cent (N=2) was from Africa.

2.3.3 Categorisation of studies for review

The 75 studies have been categorised according to the design method used for recruitment of samples (i.e. 47 studies included community based school students; 11 studies included community based college/university students, and 17 were general population based studies) (see Tables 1 and 2, Appendix A). Typically, school-based study samples included adolescents between 12 and 18 years old, whilst college studies included adolescents between 16 and 24 years old. General population based studies were considered along with either school or college-based studies depending on the age range of the study sample.

2.3.3.1 Definitions of Deliberate Self-Harm (DSH)

Different measures of DSH have been employed throughout research studies in this area. For the purposes of this review, the term DSH will be operationally defined as 'the deliberate, direct destruction of body tissue' (Favazza, 1998), including suicidal and non-suicidal self-harm. A list of the most common measures used in those studies included in the review can be found in Table 2 (see Appendix A). All included studies were categorised into one of three possible groups: (1) DSH behaviour with lethal intent - suicidal DSH/ attempted suicide; (2) DSH behaviour without lethal intent- non-Suicidal DSH; (3) Both (1) & (2), or DSH without reference to intent- mixed/unknown intent DSH. Of the 75 included

papers, 43 per cent (N=32) used a suicidal DSH measure only, 33 per cent (N=25) used a mixed/unknown intent DSH measure only, and 24 per cent (N=18) used a non-suicidal DSH measure only.

2.3.3.2 Cognitive and behavioural components of DSH

Components of DSH include suicidal ideation/thoughts, motivations for DSH and methods/type of DSH. All three were considered separately within this review.

2.3.3.3 Definition of psychological factors

For the purpose of this review, psychological correlates of DSH have been categorised into one of three possible groups: (1) family function and attachment; (2) self-regulation (comprising coping; emotion regulation; impulsivity and hyperactivity, and high-risk behaviours), and (3) psychopathology (comprising depression and anxiety; hopelessness; mania, and self-esteem). High-risk behaviours can be defined as behaviours of externalisation such as delinquency/ anti-social behaviour and drug and alcohol abuse.

2.3.3.4 Effect sizes

Effect sizes (Cohen's d) for gender differences in psychological correlates were calculated where possible from means and standard deviations or from relevant available statistics (e.g. t, F, r or χ^2). These are included within the text as a means of qualitatively comparing similar effects across studies. Where these details are not provided, odds ratios (OR) and percentages are included where possible instead.

2.4 Summary of study findings

2.4.1 DSH acts and thoughts

2.4.1.1 Prevalence, onset and course of DSH

Prevalence rates in adolescents between 12 and 18 years ranged from 5 per cent to 64 per cent in females and from 1.6 per cent to 68.4 per cent in males (see Table

1). However, all studies used varying measures of self-harm, and therefore the numbers should be regarded with caution. Three studies showed greater female to male non-suicidal DSH (Brunner *et al.,* 2007; Laye-Gindhu & Schonert-Reichl, 2005; Yates *et al.,* 2008); eleven studies reported higher female to male DSH of mixed or unknown intent (De Leo & Heller, 2004; Hawton *et al.,* 2002; Izutsu *et al.,* 2006; Morey *et al.,* 2008; Patton *et al.,* 1997; Patton *et al.,* 2007; Ponnet *et al.,* 2005; Rosow *et al.,* 2007; Ross & Heath, 2002; Walsh & Eggert, 2007; Wong *et al.,* 2007), and fourteen studies showed greater female to male suicidal DSH (Borowsky *et al.,* 2001; Bronisch *et al.,* 2005; Fleming *et al.,* 2007; Fotti *et al.,* 2006; Garrison *et al.,* 1993b; Gould *et al.,* 1998; Juon *et al.,* 1994; Lewinsohn *et al.,* 2001; Mazza & Reynolds, 2001; O'Donnell *et al.,* 2004; Rossow & Wichstrom, 1994; Thompson *et al.,* 2005; Tousignant *et al.,* 1993; Wunderlich *et al.,* 2001). Conversely, fourteen studies reported no significant differences or an equivalent rate across genders in non-suicidal DSH (Garrison *et al.,* 1993a; Lloyd-Richardson *et al.,* 2007; Lundh *et al.,* 2007; Nixon *et al.,* 2008; Zoroglu *et al.,* 2003), mixed DSH (Allison *et al.,* 1995; Bergen *et al.,* 2003; Bjarehed & Lundh, 2008; Liu *et al.,* 2005; Martin *et al.,* 1995; Martin & Waite, 1994) and suicidal DSH (Cheng & Chan, 2007; Eskin *et al.,* 2007; Flouri & Buchanan, 2002; Yip, 2005). Three studies found no significant gender differences in rates of non-suicidal DSH in adolescent school pupils, but significantly more reported suicidal DSH in females than males in the same group (Martin *et al.,* 2004; Muehlenkamp & Gutierrez, 2004; Richardson *et al.,* 2005). Similarly, Muehlenkamp *et al.* (2007) found no gender differences in non-suicidal DSH or suicidal DSH, but females were more likely than males to report engaging in both of these behaviours (Muehlenkamp & Gutierrez, 2007).

Population-based studies afford an opportunity to explore gender differences in rates of DSH across the age ranges. Evidence from five studies suggested an average onset of DSH of between 12 and 15 years old, but with females more likely to report an earlier onset than males (Brezo *et al.,* 2007; Muchlenkamp & Gutierrez, 2004; Nixon *et al.,* 2008; Wunderlich *et al.,* 2001; Young *et al.,* 2007). A number of studies also described an increase in rates of adolescent self-harming

behaviour, along with a disproportionate increase in behaviour reported by girls relative to boys between the ages of 12 and 18 years old (Juon *et al.,* 1994; Lewinsohn *et al.,* 2001; Patton *et al.,* 2007; Sourander *et al.,* 2006). However, Sourander *et al.* (2006) used a broad definition of self-harm which included *either* ideation *or* acts, and given that females have been shown to report greater levels of suicidal thoughts than males (Bronisch *et al.,* 2005; Liu *et al.,* 2005; Wang *et al.,* 2003), the latter result could be attributable to this difference. Liu *et al.* (2005) also showed an increase in rates of suicidal DSH concomitant with age in Chinese adolescents. However, greater rates of suicidal DSH were evident in boys relative to girls between 12 and 15 years, but reversed so that girls showed greater rates of suicidal DSH than boys between the ages of 16 and 18 years. This school sample was drawn from a rural Chinese population, so may reflect the different external pressures for adolescents within this 12-16 age group from those evident in Western adolescent populations (Liu *et al.,* 2005). Both Patton *et al* (2007) and Buddeberg *et al.* (1996) showed that rates of self-harm were low in early and mid puberty, but increased for reported suicidal DSH (Buddeberg *et al.,* 1996) and self-cutting and self-poisoning (Patton *et al,* 2007) during late puberty. This pattern was noted particularly in females, peaking at around 15 years old and decreasing in females thereafter. Similarly, in Lewinsohn *et al.* (2001), the greater female to male suicide hazard rate at 12 to 17 years old was shown to level at 18-19 years old. Furthermore, Lewinsohn *et al.* (2001) conducted a logistic regression analysis in order to determine whether suicide attempts in young adulthood could be predicted by suicidal behaviour (i.e. ideation and attempt) throughout adolescence. Female young adulthood suicide attempters differed significantly from female young adulthood non-attempters in levels of suicide ideation and attempts throughout adolescence. However, these differences were not apparent in the comparison of male young adulthood suicide attempters and male young adulthood non-attempters were not apparent, suggesting that adolescent suicidal behaviour continuity was evident only for females (Buddeberg *et al.,* 1996; Lewinsohn *et al.,* 2001; Patton *et al.,* 2007).

In young people between 18 and 24 years old, reported prevalence rates ranged from 1 per cent to 13 per cent for females and from 1 per cent to 6 per cent for males. However, again, rates were not consistently reported separately for males and females, and overall rates quoted were occasionally far higher (e.g. 30 per cent and 38 per cent- Brown *et al.*, 2007a; Gratz *et al.*, 2002). Equal rates of DSH have been reported in five college studies using measures of non-suicidal or mixed DSH (Brown *et al.,* 2007b; Ellis & Lamis, 2007; Gratz *et al.,* 2002; Langhinrichsen-Rohling *et al.,* 2004; Wang *et al.,* 2003), four population-based studies using measures of suicidal DSH (Kisch *et al.,* 2005; Rodriguez *et al.,* 2006; Tousignant *et al.,* 1993; Wunderlich *et al.,* 2001) and two population based studies using measures of non-suicidal and mixed DSH (Klonsky *et al.,* 2003; Young *et al.,* 2007). It is pertinent that both Tousignant *et al.* (1993) and Wunderlich *et al.* (2001) examined two samples of different age groups (approx. 14-18 years and 18-24 years), and found gender differences in prevalence rates in the younger but not older sample. Conversely, a greater female to male ratio of suicidal DSH in 18-24 year olds has been noted in only three studies (Edwards & Holden, 2001; Miller & Day, 2002; Whitlock & Knox, 2007). Whitlock *et al.* (2006) and Edwards and Holden (2001), like the school study by O'Donnell *et al.* (2004), also showed female non-suicidal and suicidal self-injurers to be more likely to 'repeat' self-harm than males (Edwards & Holden, 2001; O'Donnell *et al.,* 2004; Whitlock *et al.,* 2006a). Whilst Langrichsen-Rohling *et al.* (2004) showed no gender differences in levels of suicidal DSH, their study did show a greater level of suicide 'proneness' (as measured by the Lewinsohn, 1995, Life Attitudes Schedule- LAS, which includes self-destructive, risk taking, life-affirming and safety enhancing behaviour categories) in male, rather than female college students.

Finally, whilst the gender ratio remained the same, there was a larger overall prevalence rate for non-suicidal deliberate self-harm relative to suicidal self-harm/attempted suicide in five studies (Allison *et al.,* 1995; Bergen *et al.,* 2003; Martin *et al.*, 2004; Muehlenkamp & Gutierrez, 2004, 2007; Richardson *et al.,* 2005). One study also showed those reporting suicidal DSH but not non-suicidal

DSH were significantly more likely to be over the age of 24 years than between 18 and 20 years, suggesting that non-suicidal self-harm is more common in young people than self-harm accompanied by suicidal intent (Allison *et al.*, 1995).

2.4.1.2 Suicidal ideation

Suicidal ideation is considered a component of, or precursor to, suicidal behaviour. In those studies including assessments of ideation, females were more likely than males to report suicidal thoughts (Bronisch *et al.*, 2005, OR = 1.6; Buddeberg *et al.*, 1996; Eskin *et al.*, 2007 ; Fotti *et al.*, 2006, 4.6% males: 8.4% females; Juon *et al.*, 1994; Kisch *et al.*, 2005, 8.7% males: 9.9% females; Liu *et al.*, 2005, 17.5% males: 22.0% females; Martin *et al.*, 1995; Martin & Waite, 1994, 23.0% males : 28.4% females; Mazza & Reynolds, 2001; McKeown *et al.*, 1998, OR = 4.1; Morey *et al.*, 2008, OR = 2.3; Ponnet *et al.*, 2005; Richardson *et al.*, 2005; Rodriguez *et al.*, 2006; Walsh & Eggert, 2007; Wang *et al.*, 2003; Wunderlich *et al.*, 2001, 14-17 yrs, OR = 2.1; 18-21 yrs, OR = 1.7; Yip, 2005).

2.4.1.3 Methods of DSH

Seven studies considered self-harm methods in males and females. Females were shown to be significantly more likely than males to self-cut (Lundh *et al.*, 2007; Morey *et al.*, 2008; Whitlock *et al.*, 2006a), lacerate or self-poison (Patton *et al.*, 1997; Zoroglu *et al.*, 2003), scratch, pinch (Whitlock *et al.*, 2006a) or pull hair (Zoroglu *et al.*, 2003). Males were shown to be more likely than females to use violent or risky methods (Brezo *et al.*, 2007; Langhinrichsen-Rohling *et al.*, 2004; Langhinrichsen-Rohling *et al.*, 1998) or to punch objects with the intention of injuring themselves (Whitlock *et al.*, 2006a). Evidence also suggests that gender differences in DSH methods may reflect different underlying triggers for DSH. For example, male rates of DSH were only reported to exceed female rates where the self-hitting form of self-harm was employed or where self-injury was associated with sensation-seeking and risky behaviours (Izutsu *et al.*, 2006; Langhinrichsen-Rohling *et al.*, 1998). Similarly, in two school studies, despite

equal overall DSH rates, females showed greater rates of self-cutting than males (d = 0.76), although this was a non-significant difference in the Morey *et al* (2008) sample (no statistics presented) (Lundh *et al.,* 2007; Morey *et al.,* 2008). Moreover, in a separate school study, all methods of DSH, *except* self-cutting, were shown to be associated with psychopathology, (Bjarehed & Lundh, 2008), while in another school study, hyperactivity scores were significantly associated with DSH in both genders, again with the exception of self-cutting in females (Izutsu *et al.,* 2006). Bjarehed and Lundh (2008) suggest therefore that self-cutting in females may in some instances be a separate phenomenon, possibly driven by a 'contagion effect' rather than clear psychological difficulties (Bjarehed & Lundh, 2008).

2.4.1.4 Motivations for DSH

Five studies investigated gender differences in motivations for self-harm (Klonsky *et al.,* 2003; Laye-Gindhu & Schonert-Reichl, 2005; Lloyd-Richardson *et al.,* 2007; Morey *et al.,* 2008; Young *et al.,* 2007). Laye-Gindhu *et al.* (2005) reported that male school pupils were more likely than females to engage in self-harm due to 'boredom', 'to avoid doing something', 'to be part of a group', or 'thinking it would be fun'. Female pupils were more likely than males to engage in self harm due to feeling the 'need to hurt' themselves, or because they were 'unhappy' (Laye-Gindhu & Schonert-Reichl, 2005). Morey *et al.* (2008) showed adolescent school boys to be significantly more likely than girls to endorse 'I wanted to frighten someone', and 'to find out if someone really loved me' as motivations for self-harming behaviour (Morey *et al.,* 2008). Lloyd-Richardson *et al.* (2007) showed male college student self-harmers to endorse motivations for self-harm such as 'to make others angry' whereas female self-harm college students were more likely to endorse 'to punish myself' (Lloyd-Richardson *et al.,* 2007). In a population based internet survey Young *et al.* (2007) reported that 18-20 year old females were significantly more likely than males to engage in DSH to 'relieve anxiety' or 'to forget something'. However, there were no significant gender differences in other reasons for DSH such as 'to punish myself' or to

'relieve anger' (Young *et al.,* 2007). Finally, in a population based study of air-force recruits (average age 20 years), males and females equally endorsed the item 'hurting myself calms me down' (Klonsky *et al.,* 2003).

2.4.1.5 Summary of DSH acts and thoughts

Evidence from school, college and population based (longitudinal and cross sectional) studies suggests a gender difference in rates of suicidal and non-suicidal self-harm in early adolescence, but not young adulthood. Furthermore, rates appear greater for non-suicidal than suicidal behaviour in the 12-24 years age range. Females are more likely than males to begin self-harming at an earlier age and to repeat the behaviour. Females are also more likely than males to self-harm between the ages of 12 and 18, after which the gender difference disappears, possibly as a result of a reduction in female self-harming behaviour. One exception is in rates of self-hitting or more violent self-injury, which is more prevalent in males than females and is likely to be associated with high sensation seeking behaviour. Moreover, the evidence tentatively suggests that some self-harming behaviour, particularly in girls, may be influenced by exposure to self-harm by others. One study suggests that suicidal DSH in young adulthood may have different pathways for males and females, such that female childhood and adolescent suicidal DSH is predictive of young adulthood suicide attempts in females but not in males. Males therefore appear to engage in violent methods of self-harm more frequently than females, but are less likely than females to self-cut, overdose or ideate. Motivations for self-harm in both genders appear to be varied, and no clear differences emerged consistently across studies.

2.4.2 Psychological correlates of DSH

2.4.2.1 Family function and attachment

Five studies investigated parental 'attachment' and DSH in males and females using the Parental Bonding Instrument (PBI) (Allison *et al.,* 1995; Gratz *et al.,*

2002; Martin & Waite, 1994; Tousignant *et al.,* 1993), the Attachment Style Questionnaire (ASQ1) and the Inventory of Parent and Peer Attachment (IPPA) (Yates *et al.,* 2008). Parental 'relationships' and DSH were considered in nine studies, using various questionnaire measures (predominantly authors' own) (Bjarehed & Lundh, 2008; Borowsky *et al.,* 2001; Eskin *et al.,* 2007; Fleming *et al.,* 2007; Fotti *et al.,* 2006; Garrison *et al.,* 1993a; Liu *et al.,* 2005; Miller & Day, 2002; Ponnet *et al.,* 2005).

Allison *et al.* (1995) created a composite score of *suicidality* based on yes/no responses to the Adolescent Suicide Questionnaire (ASQ), which included questions on suicidal and non- suicidal DSH, ideations, plans and threats of suicide. Suicidality in a sample of high school students was found to be significantly correlated with the PBI 'affectionless control' category (perceived low parental care and high parental overprotection, i.e. intrusiveness and over-control) and high parental criticism, and mediated by the construct of hopelessness. There were no gender differences on the PBI, hopelessness or suicidality scores (Allison *et al.,* 1995). Martin & Waite (1994) similarly showed that in both male and female school pupils, risk of DSH (as measured by the ASQ), suicidal thoughts and depression was significantly increased in participants who assigned parents to the 'affectionless control' group (i.e. low care and high protection), except for paternal protection in females, which was not associated with self-harm. More generally, females were more likely than males to score parents as caring, while males were more likely than females to score mothers as more controlling and fathers as less controlling (no statistics available) (Martin & Waite, 1994). In another school study, Tousignant *et al.* (1993) reported low paternal care to be significantly associated with suicidal DSH in both male and female pupils, but there was less of an association with low maternal care. Interestingly, 70 per cent more females than males described negative paternal relationships, although this diminished with increasing age (Tousignant *et al.,* 1993). Yates *et al.* (2008) assessed the association between parental criticism, alienation and non-suicidal DSH, as measured by the Functional Assessment of

Mutilation (FASM), in adolescent school pupils using the Multidimensional Perfectionism Scale (MPS) and the IPPA. Perceived parental criticism was significantly associated with engagement in DSH. However, when parental alienation was entered into this pathway, the direct relationship between the two became non-significant, and was primarily accounted for by the presence of alienation, especially in males. There were no other analyses of gender conducted.

In college students, Gratz *et al.* (2002) used the PBI, Parental Attachment Questionnaire (PAQ) and Disruptions in Attachment Survey to assess parental bonding, attachment, and childhood experiences of neglect and abuse. Analyses were conducted separately for males and females, and showed separation from parents in childhood to be the strongest predictor of future self-harm in males (d = 0.82), but not females (d = 0.00), especially if the absent parent was the father. In females, paternal neglect (as assessed by PBI, 'low care and low protection') was negatively associated with frequency of self-harm. The authors suggest that this reflects an increase in self-harm frequency concomitant with a father's emotional involvement with his daughter. Conversely, insecure paternal attachment (as assessed by PAQ) was positively associated with self-harm. These findings also likely reflect the differences between the two attachment measures, where the PBI assesses a child's perceptions of a parent's behaviour and the PAQ assesses the child's feelings about these behaviours.

Two studies reported that high family cohesion was associated with a lower incidence of DSH in male and female high school students between 12 and 18 years old (Garrison *et al.,* 1993a; McKeown *et al.,* 1998). In two other school studies, parent and family connectedness and support were protective against suicide attempts in both male and female adolescents (Borowsky *et al.,* 2001; Fleming *et al.,* 2007). Two further school studies showed low family support to be significantly predictive of suicide attempts in female but not male adolescents (d = 0.09, d = 1.5) (Eskin *et al.,* 2007; Lewinsohn *et al.,* 2001). Wild *et al.* (2004)

demonstrated in analyses controlling for age and gender, in which both depression and self-esteem in all areas (peers, family, body image, sport and global) remained significantly associated with suicidal DSH, that only 'family' self-esteem remained independently associated with suicidal DSH after taking into consideration inter-correlations between the latter factors (Wild *et al.,* 2004a). They suggest that such measures are highly correlated with perceived family support, and therefore reflect positive self-worth garnered from the family environment.

Ponnet *et al.* (2005) showed that school boys from single parent families were more likely to engage in DSH (mixed/unknown intent) than boys whose primary care-giver had remained married or remarried, whilst girls in similar circumstances were more likely to experience suicidal thoughts (Ponnet *et al.,* 2005). Bjarehed *et al.* (2008) showed that an absence of positive feelings towards parents was predictive of non-suicidal DSH in male and female high school students, independent of psychopathology (Bjarehed & Lundh, 2008). Similarly, Liu *et al.* (2005) showed poor family and parental relations to be risk factors for suicidal behaviour (as measured by the Youth Risk Behaviour Survey (YRBS) and including both non-suicidal and suicidal DSH in the suicidal behaviour category) in both male and female high school students (Liu *et al.,* 2005).

In a study by Miller and Day (2002), female college students reported a greater number of suicide attempts than males, but there were too few male attempters for a statistical analysis. When male and female 'ideators' were analysed separately, paternal communication conformity (i.e. father control) and maternal expectations of perfection were positively associated with ideation in females, but there were no associations between the independent variables of family communication conformity (i.e. control), or family and self expectations of perfectionism, and ideation in males (Miller & Day, 2002). In a cross-sectional adolescent sample, Fotti *et al.* (2006) similarly showed that poor parental nurturance and increased parental rejection were positively associated with suicidal ideation and DSH in

girls and boys, but that this relationship was strongly influenced by depression. Moreover, in an adjusted multiple regression analysis, the effect of parental factors was less robust for boys than for girls (Fotti *et al.*, 2006). Both authors suggest this reflects the greater level of parental and family influence exerted over female compared to male adolescents, and which in Miller and Day's sample, is moderated by family closeness.

2.4.2.2 Summary of family function and attachment

Overall, evidence suggests that families exhibiting closeness and connectedness are protective against self-harming behaviour in both male and female adolescents, while perceived low levels of care from either or both parents may pose as a risk factor for self-harm in both male and female adolescents. Studies from schools and colleges suggest that self-harming females and males differ in their perceptions of parental bonding. In particular, compared with males, females who perceive their fathers to be overly involved, over protective and controlling show a concomitant increase in self-harming behaviour. Similarly, males are less likely than females to perceive fathers as controlling and are more likely than females to be affected by separation from their fathers in childhood. This would tend to be the case in particular for boys in families affected by divorce and separation, where the mother typically retains full child custody. Females are also more likely than males to perceive parents as caring, and are less likely than males to view their mothers as controlling. These findings are also supported by evidence from studies investigating family communication and self-harm, which suggest that compared with males, females are more affected by family environments, and more specifically those typified by a controlling father and a mother with high expectations for perfection.

2.4.2.3 Self-regulation

2.4.2.3.1 Coping

Five school studies and five college studies investigated coping and help-seeking in adolescents who self-harm (Andover *et al.,* 2007; Bjarehed & Lundh, 2008; Brown *et al.,* 2007b; Edwards & Holden, 2001; Ellis & Lamis, 2007; Eskin *et al.,* 2007; Evans *et al.,* 2005; O'Donnell *et al.,* 2004; Sen, 2004; Wang *et al.,* 2003). Bjarehead *et al.* (2008) showed ruminative/negative thinking strategies (as measured by the Emotion Regulation Questionnaire for Adolescents) to be positively correlated with DSH in school based adolescents, but this was equal in both males and females (Bjarehed & Lundh, 2008). Evans *et al.* (2005) showed that within the self-harming school student group, females were more likely than males to seek help from friends before a self-harming episode (d = 0.37) and to receive help from friends after their last self-harming episode (d = 0.53). Conversely, males who had thoughts of self-harm (but had not engaged in DSH in the past year) were more likely than females to seek help from a professional such as a psychologist (d = 0.33) (Evans *et al.,* 2005). In other school based studies, O'Donnell *et al.* (2004) and Sen *et al.* (2004) similarly showed that female self-harmers were more likely than males to tell another person or ask for help following their 'suicide attempt' (d = 0.12, d = 0.39) (O'Donnell *et al.,* 2004; Sen, 2004). Finally, female school pupils reported significantly higher levels of social support from friends than male school students (d = 0.18). Moreover, low levels of self-appraised problem solving ability were independently predictive of suicide attempts in males but not females (d = 0.55) (Eskin *et al.,* 2007)

In college students, Andover *et al.* (2007) used the Coping Strategy Indicator (Amirkhan, 1990) to investigate usage of three styles of coping: problem-solving, social-support seeking and avoidance. Females with a history of self-harm reported significantly less use of problem-solving (d = 1.09) and social-support seeking (d = 0.95), than non-self-harming females, whereas there were no significant differences between male self-harmers and non-self-harmers in usage

of these two strategies (d = 0.47, d = 0.20). Within the self-harm group gender differences were not explored (Andover *et al.*, 2007). Brown *et al* (2007) used the Positive and Negative Affect Scale-Expanded (PANAS-X) and the COPE Scale (not an acronym) (Carver *et al.,* 1989), to investigate differences in eleven emotions and in fifteen adaptive and maladaptive coping strategies in college students. Overall, females reported higher levels of social-support seeking than males (d = 0.57), while males reported greater levels of 'serenity' than females (also d = 0.57) (Brown *et al.,* 2007). Edwards and Holden (2001) used the Coping Inventory for Stressful Situations with undergraduate students, and showed avoidance coping to be associated with suicidal *ideation* in female students, but with suicide *attempts* in male students. Life meaning, as measured by the Purpose in Life Test (Crumbaugh, 1968) (which contains questions such as 'If I should die I would feel my life has been...') decreased the association between coping and suicidality to a greater extent in females than in males (Edwards & Holden, 2001). Ellis and Lamis (2007) showed female students to have greater coping and survival beliefs than males (no statistics available) (Ellis & Lamis, 2007), while Wang *et al.* (2003) reported female college students to be more likely than males to seek help for emotional distress (no statistics available) (Wang *et al.,* 2003).

2.4.2.4 Emotion regulation

One college study explored emotion regulation in DSH in males and females (Gratz *et al.,* 2002). As a result of comparable rates of self-harm in their college sample, Gratz *et al.* (2002) computed the relationships between hypothesised risk factors and self-harm separately for male and female college students. Dissociation, as measured by the Dissociative Events Scale (DES), was the most robust predictor of self-harm in females, but the second most important predictor in males. The authors suggest self-harm may be used as a 'grounding' technique in self-harmers, during dissociation.

2.4.2.5 Impulsivity and hyperactivity

Three school studies looked at the relationship between impulsivity and self-harm in males and females (Garrison *et al.,* 1993a; Hawton *et al.,* 2002; Langhinrichsen-Rohling *et al.,* 1998). Garrison *et al.* (1993) measured impulsivity, defined as 'acting before considering one's actions' using the Kiddie Schedule for Affective Disorders and Schizophrenia for School Aged Children (K-SADS) (Ambrosini & Dixon, 1996), and found it to be a predictor of self-harm only in simple regression models, losing significance when included within multivariate models. Although gender was controlled for in multivariate analyses, mean impulsivity scores suggested slightly higher but non- significant levels of impulsivity in male relative to female self-harming school pupils (Garrison *et al.,* 1993a). Hawton *et al.* (2002) showed impulsivity, as measured by Plutchik's Impulsivity Scale (Plutchik & van Praag, 1989), to be significantly independently associated with self-harm in female (d = 0.60) but not male school pupils (Hawton *et al.,* 2002). In separate analyses, Langhinrichsen-Rohling *et al.* (2004) showed impulsivity, as measured by Eysenck's impulsivity scale (Eysenck *et al.*, 1985), to be predictive of suicidal behaviour in both male and female college students (Langhinrichsen-Rohling *et al.,* 2004). In a population based study, Nixon *et al.* (2008) showed gender, depression and impulsivity-inattention related problems to be significant predictors of non-suicidal self-harm behaviour, although analysis of gender differences on these factors was not conducted (Nixon *et al.,* 2008). McKeown *et al.* (1998) investigated impulsivity (also measured using K-SADS) and self-harm in adolescents, by entering it as a predictor variable along with gender. It was significantly associated with suicide plans but not ideations or attempts, raising the question of the role of impulsivity (i.e. acting without consideration of consequences), in the contemplation of self-harm methods (McKeown *et al.,* 1998).

Three studies investigated the relationship between hyperactivity and self-harm in adolescents. Izutsu *et al.* (2006) measured hyperactivity in junior school students using the Wender Utah Rating Scale. In both genders, hyperactivity scores were

significantly associated with DSH (self-hitting and self-cutting) and substance use (cigarettes and alcohol), with the exception of self-cutting in females. Bjarehed and Lundh (2008) also showed a significant correlation between hyperactivity-inattention symptoms and conduct problems in both males and females who self-harmed (Bjarehed & Lundh, 2008; Izutsu *et al.,* 2006). In a longitudinal population study, Reinherz *et al.* (1995) suggested that non-gender normative behaviours (i.e. externalisation in females and internalisation in males) may be indicative of greater psychological difficulties, or may invoke strong reactions in parents and teachers, resulting in a later internalisation of problems (Reinherz *et al.,* 1995).

2.4.2.6 Summary of self-regulation

The results of these studies suggest that whilst in general adolescent self-harmers are less likely than non-self-harmers to report difficulties to others, female self-harmers are significantly more likely than male self-harmers to use inter-personal/social-support strategies as a means of coping, and therefore are more likely to seek help from friends or to tell someone else about their problems. One exception is reported in a study reporting that male adolescents are more likely than females to report difficulties to a professional. Affect regulation and its relationship with self-harm was only investigated in one college based study, which showed dissociation to be a robust predictor of self-harm in both genders, but to a greater extent in females than in males. The results of the reviewed studies would suggest that impulsivity of the sensation-seeking type is greater in males than in females, and may be manifested by increased engagement in risky or anti-social behaviours. However, when present in females, it appears to be more strongly associated with suicidal behaviour, and therefore may represent a more serious expression of difficulties than when present in males.

2.4.2.7 High-risk behaviour

Seven studies examined high-risk behaviour (i.e. drug and alcohol use, promiscuity, violence and general anti-social/delinquent behaviour), self-harm and

gender in adolescents. Examination of the significant effect of gender as a covariate in an analysis of differences between suicidal and non-suicidal school pupils, revealed that males engage in significantly more drug use (d = 0.26) and high-risk behaviour than females (d = 0.57) (Walsh & Eggert, 2007). Similarly, alcohol problems have been shown to be greater in a population based sample of adolescent males than in females, and male school pupils to be more likely to be drunk or under the influence of drugs when self-harming, than female school pupils of the same age (Morey *et al.,* 2008; Wunderlich *et al.,* 2001). However, Waldrop *et al.* (2007) showed female gender and drug and alcohol problems to be significant adolescent self-harm predictors (among others) (Waldrop *et al.,* 2007). Garrison *et al.* (1993) showed levels of aggression and recklessness to be higher in male than female adolescents (d = 0.74), and for aggression, but not other risk taking behaviours, to be associated with DSH in both genders. Female gender emerged as the strongest predictor of suicidal behaviour in this model (Garrison *et al.,* 1993b). In a follow up birth cohort study, aggression and female gender were also significant predictors (among others) of self-harm in adolescents (Sourander *et al.,* 2006). Mazza and Reynolds (2001) showed conduct disorder in male school pupils to be significantly predictive of suicidal behaviour, although the same effect was less significant in the female school sample, while Patton *et al.* (1997) showed anti-social behaviour to be significantly associated with DSH in female (d = 3.0) but not male school pupils (d = 0.6) (Mazza & Reynolds, 2001; Patton *et al.,* 1997).

2.4.2.8 Summary of high-risk behaviours

The evidence suggests that males are more likely than females to have substance abuse problems, to have higher levels of aggression and to engage in reckless, risky and anti-social behaviours. The relationship between high-risk behaviour, gender and self-harm is more complex, with suggestions that aggression and delinquent behaviour are predictors of suicidal DSH in both males and females, or in some studies more robust predictors of self-harm in females than in males.

2.4.3 Psychopathology

2.4.3.1 Hopelessness

Two school studies showed levels of hopelessness to be significantly greater in female relative to male adolescents (d = 0.10, d = 0.34) (Thompson *et al.,* 2005; Walsh & Eggert, 2007), while one population study showed three or more episodes of hopelessness to be more frequently reported by females (Kisch *et al.,* 2005). Hopelessness significantly mediated the relationship between perceived attachment and suicidality, but there were no significant gender differences (Allison *et al.,* 1995). Bergen *et al.* (2003) identified hopelessness as significantly associated with suicidal ideation and suicidal DSH attempts in male but not female school pupils who were victims of child sexual abuse (CSA). In a similar study, hopelessness and depression mediated the relationship between CSA and suicidal DSH in females (Martin *et al.,* 2004). Hopelessness, measured by a single item on the Beck Depression Inventory (BDI) (Beck *et al.*, 1961), was not significantly associated with suicide risk in male or female adolescents, despite being in the hypothesised direction, but this was attributed to low statistical power due to a small sample (Lewinsohn *et al.,* 2001). In college, but not school students, hopelessness levels were significantly greater in males relative to females (d = 0.27) (Langhinrichsen-Rohling *et al.,* 1998). However, in a later study, hopelessness in college students was shown to be associated with suicide proneness, but only in females (Langhinrichsen-Rohling *et al.,* 2004). Hopelessness was positively correlated with avoidance coping and was predictive of future suicidal ideation and behaviour (but not attempts) in both male and female college students (Edwards & Holden, 2001).

2.4.3.2 Depression and anxiety

Two studies showed either equivalent levels of depression or no significant differences in levels of depression in male and female adolescents (Fleming *et al.,* 2007; Martin *et al.,* 1995). Fourteen studies reported significantly greater levels of psychological distress (depression and/or anxiety) in females relative to males

across the age ranges (Eisenberg *et al.*, 2007; Eskin *et al.*, 2007, d = 0.10; Juon *et al.*, 1994; Langhinrichsen-Rohling *et al.*, 1998, d = 0.36; Laye-Gindhu & Schonert-Reichl, 2005, d = 0.46; Lewinsohn *et al.*, 2001, d = 0.52; Patton *et al.*, 2007, d = 1.10; Richardson *et al.*, 2005, d = 0.22; Sen, 2004; Thompson *et al.*, 2005, d = 0.15; Walsh & Eggert, 2007, d = 0.55; Wichstrom & Rossow, 2002, d = 0.47; Wild *et al.*, 2004b; Wunderlich *et al.*, 2001). However, effect sizes vary from very small to large, suggesting that there may not be a reliable difference across adolescents.

Reinherz *et al.* (1995) showed that early onset (< 14 years old) of psychological problems (e.g. depression or anxiety) significantly increased the risk of suicidal ideation at 15 years and a suicide attempt by 18 years in both genders. Lewinsohn *et al.* (2001) showed that occurrences of manic depressive disorder were significantly more frequent in females than males from the age of 5 years to 23 years old, and that whilst DSH increased in females between the ages of 12 and 18 years, unlike depression, DSH in these females decreased after this point. Moreover, whilst depression was predictive of suicide 'potential' in both genders, in one school based study it was only significantly associated with suicide attempts in females (Eskin *et al.*, 2007). Similarly, in another school based study, depression and anxiety were both significantly independently associated with self-harm in females, but not males (Hawton *et al.*, 2002).

Wichstrom and Rosow (2002) showed that by statistically controlling for internalising disorders such as depression and eating disorder, which were significantly greater in female relative to male school students, the original gender difference for suicidal DSH was eliminated (Wichstrom & Rossow, 2002). Bergen *et al.* (2003) showed the association between depression and non-suicidal DSH and suicidal ideation to be greater in female than in male school pupils who were victims of CSA, whilst hopelessness was more strongly associated with non-suicidal DSH in males than in females (Bergen *et al.*, 2003).

Thompson *et al.* (2005) observed greater levels of depression, anxiety and suicidal behaviour in Mexican females relative to males, but in separate gender models depression had a greater effect on suicidal DSH in males than in females (Thompson *et al.,* 2005). Similarly, Klonsky *et al.* (2003) reported that differences between depression and anxiety were greater between male self-harmers and non- self-harmers than for females (Klonsky *et al.,* 2003). For male adolescents, depression, anxiety and substance abuse increased risk for suicide attempt, whereas only depression and anxiety increased this risk in females (Gould *et al.,* 1998).

2.4.3.3 Mania

Only one study investigated the relationship between self-harm and mania across the genders. Bronisch *et al.* (2005) investigated levels of mania and hypomania in 14 to 17 year olds. Of the total sample (N=3021), 1.5 per cent were classified as manic, of which 16.1 per cent had attempted suicide in the past. Females reported significantly more suicide ideation and attempts than males. Suicide attempts were also strongly associated with mania (but less strongly with hypomania after controlling for depression), although this association decreased with age. There were, however, no significant gender differences for mania or hypomania levels, possibly as a result of small numbers and hence low statistical power (Bronisch *et al.,* 2005).

2.4.3.4 Self-esteem

Five school studies showed male school pupils to score higher than females in levels of self-esteem (Eskin *et al.*, 2007, d = 0.08; Richardson *et al.*, 2005, d = 0.22; Walsh & Eggert, 2007, d = 0.29; Wild *et al.*, 2004b), and global self-worth and body satisfaction (Wichstrom & Rossow, 2002, d = 0.42, d = 0.77), despite males being twice as likely as females to perceive themselves as failing

academically at school[2] (Richardson *et al.,* 2005). Similarly, Wild *et al.* (2004) showed girls at 13 and 16 years old to have lower mean levels of self-esteem in all areas (peers, family, body image, sport and global) than boys of the same age, except for 'school' self-esteem in 16 year olds, for which there was no significant gender difference (Wild *et al.,* 2004b). Level of self-esteem (as measured by the Rosenberg Self-Esteem Scale, RSES) was also shown in one study to be associated with suicidal and non-suicidal self-harm in adolescents, but was not significantly different for males and females (Lundh *et al.,* 2007). Self-esteem has also been shown to be predictive of suicide attempts in both males and females (Eskin *et al.,* 2007), in females but not males (Lewinsohn *et al.,* 2001), or associated with suicidal thoughts and attempts in male but not female students (Wang *et al.,* 2003). Lewinsohn *et al.* (2001) used a nine item measure which assessed general and physical self-esteem. Similarly, Bjarehead and Lundh (2008) identified a positive correlation between rumination and DSH in both male and female school pupils, but an association between eating disorder, negative 'body self-esteem' and DSH was found only in females (Bjarehed & Lundh, 2008).

2.4.3.5 Summary of psychopathology

The evidence suggests that female self-harmers are more likely than males to experience internalising disorders such as depression and anxiety, that this gender difference persists from a very early age well into adulthood, and that both may be associated with DSH in females, all though there may be different mediating factors for both. The literature concerning the relationship between hopelessness, gender and self-harm is unclear. Females in some studies report greater levels of hopelessness than males, and hopelessness appears to be associated with poor coping strategies. Like impulsivity, hopelessness also appears to have an indirect

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[2] All of the above, with the exception of Wild *et al* (2004), used the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965), a ten item 'general' self-esteem measure

effect on self-harming behaviour, e.g. mediating the relationship between CSA or attachment and DSH, but results suggest that this pathway may be different for females and males. Finally, results also suggest that adolescent males enjoy higher levels of self-esteem than females, and predominantly in areas such as body image, general self-worth and family. Conversely, there is less support for differences in levels of academic or school-based self-esteem, suggesting that females remain as confident as males about their academic abilities.

2.5 Discussion

A systematic search of the literature was employed for this review of gender differences in psychological factors associated with DSH in community-based adolescents (12-24 years old). The results reveal a complex array of correlates for which gender differences are well established or where the literature remains unclear.

This review has been limited only to studies which have explicitly explored gender differences in psychological correlates of self-harm in community-based adolescents. As a result, other studies which may have better investigated the direct associations between these correlates have not been included. Secondly, the purpose of this review was to extrapolate from the literature which psychological correlates of self-harm may differentiate between the genders in community-based adolescent self-harmers. There may therefore be other equally relevant social and environmental correlates which could not be commented upon within this review. Finally, given the volume of studies and variety of methodologies included, it has not been possible to conduct either a more thorough methodological analysis or a quantitative analysis (meta-analysis), and therefore the results presented may be limited by the absence of such approaches.

2.5.1 Results overview

2.5.1.1 Conclusions

The results of this narrative review suggest that females are more likely than males to engage in self-harm and have thoughts about self-harm during adolescence, and are also more likely than males to repeat such behaviours. Moreover, whilst males appear to engage in more violent forms of self-harm, there is some evidence to suggest that other forms of DSH such as self-cutting may be more prevalent amongst female adolescents who are influenced by exposure to self-harm by peers.

The results also suggest that female self-harmers report greater levels than males of depression, anxiety and, in some cases, hopelessness. Hopelessness has been shown variously to have no association with self-harm, an indirect mediating relationship between self-harm and other factors, or, as in one study, an association between hopelessness and avoidance coping in both males and females. It is as yet unclear therefore in what way hopelessness differs between males and females in its relationship to self-harm.

Self-esteem also appears to be indirectly associated with suicidal behaviour, possibly through its relationship with depression, and appears more strongly associated with self-harm in females than in males. However, although males report higher levels of self-esteem than females, this seems to be robust in areas such as body image and general self-worth. Measures of self-worth which focus on less gender relevant areas, report no such differences.

Rates of impulsivity of the sensation-seeking type are also higher in males than in females. However, where impulsivity is present in females, some studies show it to have a more robust association with self-harm in females than in males.

Studies also show that despite adolescent self-harmers generally using more avoidance and less help-seeking strategies than non self-harmers, female self-harmers still use more pro-social coping strategies and help-seeking from friends than male self-harmers. There was unfortunately a lack of studies investigating emotion regulation and gender, and an absence of such studies in school based samples. Some suggest this is due to the lack of an agreed definition of emotion regulation (Gratz & Roemer, 2008)

Finally, the results suggest that females and males may be differentially affected by levels of perceived care and over-protection by parents. Again, there was a lack of investigations of gender, attachment and self-harm, and an absence of such studies using more effective measures of attachment, for example The Adult Attachment Interview (George *et al.*, 1986).

2.5.2 Methodological considerations

2.5.2.1 Definitions and measurement of self-harm

It is reasonable to presume that the results of the review were influenced by the type of DSH behaviour under scrutiny in each of the reviewed studies, especially since a mixture of suicidal and non-suicidal DSH, and DSH where intent is unclear, have been investigated and included in the review. Current researchers are more aware of the differences which exist between self-harming behaviour with and without intent, in particular with regard to function, where the latter may be used primarily as a means of affect regulation. However, the issue of definition remains obfuscated by the fact that non-lethal self-harm is often motivated by a complex array of factors, which may later play a part in motivating suicidal DSH.

A multitude of varying measures of DSH have been used, from the more restrictive measures of suicidal behaviour or non-suicidal behaviour, to the

measures of self-harm regardless of intent. Even within the latter categories, examples of self-harming behaviour within questionnaires, which act as cues for recall of DSH, also vary. Some list no examples, such as the Modified Beck Suicide Intent Scale and Adolescent Suicide Questionnaire (Beck *et al.*, 1979), whilst others list only overdose and cutting, such as CASE (Hawton *et al.*, 2002). Others detail up to sixteen examples of possible self-harming behaviour, for example, the Gratz DSH Inventory (Gratz, 2001) (see Table 2 for further descriptions). Finally, a high proportion of questionnaires may not encompass all of the harmful behaviours engaged in, particularly by males, resulting in a possible underestimate of DSH rates in male samples. For example, as shown by Langrichsen-Rohling (1998), males report greater levels of sensation-seeking and risk taking behaviour (such as neglecting health) than females, a construct not typically included in DSH measures. Nonetheless, while prevalence rates may be affected by the type of self-harm measure employed, the gender ratio appears relatively consistent across measures and age ranges. Furthermore, results do suggest that these behaviours exist together on a continuum, given that both suicidal and non-suicidal behaviour share important risk factors such as depression, poor family or attachment experiences and ineffective self-regulation.

Similarly, variations in measures of important psychological constructs such as depression, anxiety, hopelessness and impulsivity will result in differing outcomes. The standardisation of DSH surveys incorporating risk factor measures such as the Child and Adolescent Self-Harm in Europe (CASE) Survey (Hawton *et al.*, 2002) for use across European studies may ameliorate differences emerging as a result of methodological inconsistency.

Another important factor affecting results across studies, and in particular presumed prevalence rates across genders, is participant response to self-report measures of DSH. Evidence from three of the reviewed studies suggests that males are significantly less likely than females to respond to survey questions about self-harm (De Leo & Heller, 2004; Flouri & Buchanan, 2002; Nixon *et al.*,

2008), but also, a further four studies conclude that adolescent males are less likely than females to tell someone about an attempt or to seek help from others (Evans *et al.,* 2005; O'Donnell *et al.,* 2004; Sen, 2004; Wang *et al.,* 2003). This implies that in spite of the anonymity of self-report measures employed, males could still be under reporting self-harming behaviour.

2.5.2.2 Design and analysis

The majority of included studies were cross-sectional in design, and therefore comments can be made on the relationships between factors but not on causality. Those studies employing a longitudinal design are better able to investigate and comment upon relationships over time (Brezo *et al.,* 2007; Bronisch *et al.,* 2005; Buddeberg *et al.,* 1996; Lewinsohn *et al.,* 2001; Reinherz *et al.,* 1995; Sourander *et al.,* 2006; Wichstrom & Rossow, 2002; Yates *et al.,* 2008). However, such studies are still limited by attrition or by low numbers of self-harmers across genders.

A limited number of studies conducted separate analyses for males and females, and therefore across studies statistical methods varied. This variation in methodology makes it more difficult to compare results between studies, even when reviewed qualitatively. Secondly, where univariate and descriptive analyses have been employed before a regression analysis, gender is frequently entered into models as a predictor variable along with a number of other potential risk factors, thus obscuring any differential relationships between males and females on these factors. Similarly, where univariate analyses have been conducted and revealed non-significant relationships between individual factors and self-harm, these factors have subsequently been excluded from the multivariate analysis. This removes factors, including on some occasions gender, which could potentially prove significant when combined with other variables. Gratz *et al.* (2002) recommended that gender analyses be conducted separately for females and males for this very reason. Several studies also attempted to test the relationship

between several different variables and self-harm within one model, which, whilst reflecting the complex array of inter-related factors associated with self-harm, made it difficult to tease out individual relationships. Finally, some studies were unable to further analyse results between genders due to the small number of male self-harmers, therefore limiting their ability to adequately describe gender differences.

2.5.2.3 Implications for future research

This review highlights the need for a universal and consistent definition of self-harming behaviour, in order to guide future research in this area, and enable reviewers to consolidate findings across the literature. This review also serves to emphasise the need for a more hypothesis-driven approach to the investigation of self-harm. To date, the psychological correlates or risk and vulnerability factors are well-documented. Therefore, future research ought to focus on identifying the nature of the relationships between these factors. Finally, the gender paradox in self-harm is also well-documented, but currently poorly understood. Another future research goal should therefore be the elucidation of the relationship between factors underlying gender differences in self-harming behaviour in adolescents.

Chapter 3: Aims and Hypotheses

3.1 Aims and hypotheses

Evidence suggests increased rates of psychopathology in adolescents who self-harm and gender differences in adolescent psychopathology, such that females more frequently report experiences of internalising disorders (e.g. anxiety and depression), compared to males who more frequently conform to categories of externalising disorder (e.g. delinquent behaviour and substance abuse) (Hyde *et al.*, 2008). However, depression, anxiety and hopelessness all appear to be associated with self-harm in both sexes (Evans *et al.*, 2004). The first aim was to attempt to replicate the finding that internalising disorders are positively associated with self-harm in males and females. Based upon the available evidence the first hypothesis was as follows:

Hypothesis 1: Depression, anxiety and hopelessness are interrelated in adolescents who self-harm, and are positively associated with self-harm in both males and females.

The Experiential Avoidance Model of DSH proposes that temperament based response tendencies and ineffective self-regulation may underlie experiential avoidance and thus predispose an individual to DSH behaviour (Chapman *et al.*, 2006). Gray's (1991) BIS/BAS are hypothesised biological systems underlying avoidance and approach based behaviour tendencies, and may therefore be associated with self-harming behaviour. BIS/BAS and ineffective emotional coping strategies are empirically and differentially linked to internalising and externalising disorders (Beevers & Meyer, 2002; Hundt *et al.*, 2008). BIS has been shown to mediate the link between parental overprotection and psychopathology, and has also shown an association with suicidal ideation, mediated by social perfectionism (Meyer *et al.*, 2004; O'Connor & Forgan, 2007). Conversely, high BAS has been linked to mania in people with bipolar disorder,

although it is unclear how BAS impacts upon self-harming behaviour (Alloy *et al.*, 2008). Impulsivity of the sensation-seeking type (SS) although related to BAS, may reflect a different construct described as a 'rash spontaneous' impulsivity, for which links with suicidal tendencies and aggression have previously been established (Gorlyn, 2005). The second aim of this investigation was to test the proposal that BIS/BAS may be differentially and indirectly linked to deliberate self-harm in male and female adolescents. The hypotheses relating to this aim were as follows:

Hypothesis 2: Internalising symptoms of anxiety, depression and hopelessness in male and female adolescents who self-harm are positively associated with BIS and negatively associated with BAS.

Hypothesis 3: BIS shows a stronger positive association with self-harm in females compared to males,

Hypothesis 4: Sensation-seeking shows a stronger positive association with self-harm in males compared to females.

Gender differences in more general coping styles have also been reported in the literature, suggesting that females engage in more pro-social, help seeking behaviours than males, who more frequently use problem solving or avoidant strategies (Eschenbeck *et al.*, 2007), although other studies show no such differences. Evidence also suggests that these differences are apparent in adolescents who self-harm, and that pro-social strategies may be indicative of adaptive coping in females but not males, whilst low levels of problem-solving coping is independently predictive of self-harm in males only (Eskin *et al.*, 2007; Evans *et al.*, 2005; Sen, 2004). Although one study showed more general maladaptive strategies to be associated with self-harm in both sexes (Bjarehed & Lundh, 2008). The third aim of this investigation therefore, was to determine

whether there was a differential relationship between adaptive and maladaptive coping/self-regulation strategies (specifically non-productive, problem focused and reference to others coping) and deliberate self-harm in male and female adolescents, with the associated hypotheses being as follows:

Hypothesis 5: Non-productive coping strategies are positively associated with self-harm in both males and females.

Hypothesis 6: Problem-solving coping strategies show a stronger negative correlation with self-harm in males than in females.

Hypothesis 7: Reference to others coping strategies show a stronger negative correlation with self-harm in females than in males.

The literature suggests that family function and parental relationships are important risk factors for deliberate self-harm, but that that different attachment experiences may differentially affect males and females who self-harm. In particular, evidence suggests that paternal overprotection is positively correlated with self-harm in females, but not males (Gratz *et al.*, 2002; Miller & Day, 2002). Other evidence has showed low parental care to be positively associated with self-harm in both genders, but for early separation from the father to be more predictive of self-harm in males than females (Ponnet *et al.*, 2005). Evidence also suggests a link between behavioural inhibition and attachment, and between attachment style and adult psychopathology (Main, 1996; Meyer *et al.*, 2001). The fourth aim of this investigation therefore was to further explore the relationship between perceived parental attachments, BIS/BAS and DSH.

Hypothesis 8: Parental overprotection in females is more strongly correlated with self-harm in females than in males, whilst parental care is more strongly associated with self-harm in males than in females.

Hypothesis 9: Parental care is negatively associated with sensation-seeking and BAS, while overprotection is positively correlated with BIS and emotional distress (depression, anxiety and hopelessness) in male and female self-harming adolescents.

Whilst the associations between psychological variables and their relationships with self-harm can be established, this does not allow us to interpret in what way these factors interact with one another to directly or indirectly relate to DSH. Therefore, our final aim was to test an a-priori model of the relationships between emotional distress, BIS/BAS, sensation-seeking, coping and parental bonding and their interaction with one another to predict DSH, separately in males and females using path analysis. With some reference to the EAM model, which proposes that emotional response is managed through emotion regulation skills, a failure of which can result in experiential avoidance of the emotion and therefore deliberate self-harm, the final hypothesis is therefore as follows:

Hypothesis 10: There is a direct association between emotional distress (depression, anxiety and hopelessness) and self-harm in both males and females, which is mediated by adaptive coping (reference to others and problem-solving), maladaptive coping (non-productive), BIS, and impulsivity (BAS, and SS), and the latter of which (i.e. BIS, BAS and SS) are moderated by perceived parental bonding (care and overprotection). Our null hypothesis is therefore that there are no differences between males and females in the fit and coefficients of this a-priori model.

Chapter 4: Methods

4.1 Design

This was a cross-sectional study of community-based adolescents (14 – 24 years old) using standardised questionnaire measures. A correlational cohort design was used to examine the relationships between gender and factors associated with self-harm in young people who have and have not self harmed.

4.2 Participant recruitment

4.2.1 Inclusion criteria

Participants were considered suitable for inclusion if they were consenting school pupils or 1st year college/university students between the ages of 13 and 24 years old.

4.2.2 Schools

Permission to approach individual schools to request research participation was sought from Local Authorities and Directors of Education. Permission was granted by West and Mid-Lothian Directors of Education and Edinburgh City Council Children and Families Neighbourhood Department (see Appendix B). Permission was not granted by an unnamed City Council due to concerns over the inability of current mental health services to meet any increasing demand which may ensue following school research participation (see Appendix B). A standard letter was then sent to all secondary schools in the agreed areas (see Appendix C). Schools who had not responded to this letter within one month were then contacted by telephone. A total of 30 schools were approached of which three (two West-Lothian state schools and one Edinburgh all-female private school) agreed to participate in the study. Most schools cited other research or curricular commitments or concerns over the sensitivity of the subject matter, as reasons for non-participation. One state school withdrew from the study on the day of data

collection, due to a teacher's concerns over pupils being exposed to information which might encourage them to self-harm (see discussion).

4.2.3 Universities and colleges

All individual schools within Edinburgh University, Queen Margaret University, Napier University, Heriot Watt University, Edinburgh Art School and Lothian Further Education (FE) Colleges were contacted by telephone and then email (see Appendix D). Permission was then sought to email all first year students within their schools requesting voluntary participation and enclosing a web-link to the online survey (see Appendix D). Select schools within the universities of Edinburgh, Queen Margaret, Napier and Heriot-Watt, and Edinburgh Art College agreed to participate. No FE Colleges agreed to participate. Two emails were sent to administrators in participating schools. The first was an information email from a registered university account, and the second was an email from a specific address set up for the purposes of the study (wellbeingsurvey@gmail.com), containing an in invitation to participate in the research and a web-link to the online survey, and was to be forwarded to all first year students (see Appendix D).

4.2.4 Sample

448 students consented to participate in the online study (i.e. 1st year university/college undergraduates). 160 school pupils were recruited from 2 secondary schools in Edinburgh and Lothian (i.e. 100 3rd and 4th year state schools pupils from 5 PSE classes and 60 3rd year private school female pupils from 3 PSE classes).

4.3 Materials

4.3.1 Questionnaires

Measures used within the questionnaire are detailed in 4.3.1.2- 4.3.1.11 (See Appendix F for a copy of the questionnaire)

4.3.1.1 Demographics

Basic demographic data of age, gender and school (but not college or university) were collected. In order to ensure anonymity, no names, dates of birth or further demographic information were requested.

4.3.1.2 Relationship Questionnaire (RQ) (Bartholomew, 1991)

The RQ is a two-part measure devised to describe the attachment styles of adult or young adult close peer relationships and comprises four paragraphs describing four prototypical adult attachment patterns: (A) Secure; (B) Fearful-avoidant (C) Preoccupied, and (D) Dismissive-avoidant. In the first part, participants rate how far each attachment type reflects their own style using a 7-point Likert-type scale ranging from 'Not at all like me' to 'Very much like me', and thus providing a 'continuous' measurement of all four attachment styles in an individual. In the second part, participants are asked to identify one of the four styles which best reflects their own style. This ensures that where two styles are rated equally highly, then the forced choice paragraph will reveal the overall preference. The forced choice paragraph also acts to minimise order effects when completing the ranking of styles. The RQ has been shown to have good construct validity (Griffin & Bartholomew, 1994). As a result of the variable internal reliability, the authors advise usage of an additional self-report attachment measure (Griffin & Bartholomew, 1994).

4.3.1.3 Parental Bonding Instrument (PBI) (Parker *et al.*, 1979)

This is a 25 item retrospective measure of the perceived parental style of an individual's mother and father in the first 16 years of life. The measure is completed separately for the mother and father, with the same 25 items in each. The two variables 'Care' and 'Overprotection/control' are measured, of which there are 12 and 13 items respectively. Based on this measure, parents can also be assigned to one of four 'style quadrants': (1) 'Affectionate constraint' (high care and high protection); (2) 'Affectionless control' (high protection and low care);

(3) 'Optimal parenting' (high care and low protection), and (4) 'Neglectful parenting' (low care and low protection). The PBI has been used extensively with both clinical and non-clinical adult and adolescent populations. Several studies with non-clinical populations have shown the PBI to have good internal reliability (Cronbach's α=0.85-0.93 for Care; Cronbah's α =0.74-0.90 for Overprotection) (Parker, 1999; Parker *et al.,* 1979). Convergent validity is low to moderate. A comparison of adolescents' responses on the PBI and the more extensive Adult Attachment Interview (AAI) (George *et al.*, 1986) showed similar results in young people with optimal attachment histories, but not in those who showed anger or idealisation towards their mothers, and hence is considered unsuitable for use with clinical populations, where extreme attachment histories are prevalent (Manassis *et al.,* 1999; Parker, 1999).

4.3.1.4 The Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983)

The HADS is a 14-item present state self-assessment scale containing 7 items relating to depressive symptoms and 7 items relating to anxiety symptoms experienced in the past week. All items are rated on a four-point Likert scale. A total score combines all 14 items and scores can range from 0-21. The HADS was originally developed as a brief measure of 'possible and probable' states of anxiety and depression in a non-psychiatric hospital out-patient setting. To reduce the potential confound of physical illness, somatic symptoms which could relate to physical disorders but which are also associated with depressive and anxious states such as nausea and dizziness were removed. Although initially intended for use with adults, HADS has been demonstrated as psychometrically sound and useful for use with adolescent clinical and non-clinical populations (White *et al.,* 1999). However, modified cut-off scores have been recommended in order to reduce false negative responses in adolescents. Scores of between 7 and 9 on depression items and between 9 and 11 on anxiety items would therefore be indicative of depressive and anxious states respectively (White *et al.,* 1999). A recent review of 71 research studies using HADS as a measure with the general population, showed that it is of adequate internal reliability (mean Cronbach's α

=0.83 for anxiety; mean Cronbach's α =0.82 for depression), adequate specificity and sensitivity (using ROC Curves) and good concurrent validity based on medium to strong correlations with other measures including the Beck Depression Inventory (Beck *et al.,* 1961) and the General Health Questionnaire (Bjelland *et al.,* 2002).

4.3.1.5 The Beck Hopelessness Scale (BHS) (Beck *et al.,* 1974)

This is a 20-item forced choice measure of hopelessness, whereby participants are required to indicate agreement (True) or disagreement (False) with statements relating to expectations about the future. Factor analytic studies have previously indicated three underlying factors which relate to affective (feelings abut the future), motivational (loss of motivation) and cognitive (future expectations) components (Beck *et al.,* 1974; Velting, 1999). However, the results of a number of other studies of BHS factor structure would suggest that consensus has yet to be reached (Steed, 2001). A recent study of the BHS in a non-clinical group of undergraduates, showed adequate internal reliability (Cronbach's α = 0.88) and good convergent validity, based on strong correlations with other optimism measures (Steed, 2001). Recommended cut-off scores suggest that scores of 4-8 reflect mild levels of hopelessness, scores of 9-14 suggest moderate levels of hopelessness, and scores of 14 > reflect severe levels of hopelessness.

4.3.1.6 The Behavioural Inhibition System and Behavioural Activation System (BIS/BAS) Scales (Carver & White, 1994)

The BIS/BAS Scales comprise 24 statements with four sub-scales. These scales reflect: (1) BIS sensitivity (7 items); (2) BAS Drive (4 items); (3) BAS Fun seeking (4 items), and (4) BAS Reward Responsiveness (5 items). Evidence from factor analytic studies appears to support this four factor structure (Carver & White, 1994; Jorm *et al.,* 1998). Participants must rate their level of personal agreement on a four-point Likert scale ranging from 'Very True for Me' to 'Very False for Me'.

Gray (1987) proposed that two biological systems underlie both animal and human motivations to approach something desired, mediated by conditioned signals of reward, or to avoid something aversive, mediated by conditioned signals of punishment (Gray, 1987). Carver and White's scales were designed to assess differences in individual sensitivities to Gray's two hypothesised behavioural systems (i.e. BIS and BAS) (Carver & White, 1994; Gray, 1987). The BIS scale is therefore a measure of an individual's sensitivity to future unpleasant events, whereas the BAS is a measure of an individual's sensitivity to future pleasant events. Factor analytic studies have shown BAS to load strongly on an impulsivity factor which reflects 'a purposeful drive towards rewarding stimuli', and to be distinct from a second impulsivity factor which reflects 'a rash spontaneous impulsivity', typically measured by scales of sensation-seeking (Dawe & Loxton, 2004).

In a non-clinical community sample, internal consistency has been shown to be good (Cronbach's α = 0.65-0.83), and correlations between the scales and other personality measures have shown strong associations between BIS and the neuroticism factor of the Eysenck Personality Questionnaire (EPQ-R) (Eysenck & Eysenck, 1975) and the negative affect factor of the Positive and Negative Affect Schedule (PANAS) (Watson *et al.*, 1988), and between BAS and the Extraversion factor of the EPQ and the positive affect factor of the PANAS (Jorm *et al.,* 1998). Gender and age differences have also been noted on these scales. BIS and BAS reward seeking scores were higher in females than males, and BAS drive scores higher in males than females, while BIS/BAS scores overall were lower in older age groups (Jorm *et al.,* 1998) (see introduction).

4.3.1.7 Adolescent Coping Scale- Short Form (ACS) (Frydenberg & Lewis, 1993)

The ACS Short Form is a 19-item self-report measure which assesses 18 distinct coping strategies, comprising 18 items from the ACS 80-item Long Form, and is therefore a more suitable measure for time-limited surveys. These strategies include: seeking social support; focus on solving the problem; working hard and

achieving; worry; investing in close friends; seeking to belong; wishful thinking; not coping; tension reduction; social action; ignoring the problem; self-blame; keeping to self; seeking spiritual support; focus on the positive; seeking professional help; seeking relaxing diversions, and physical recreation. These are then conceptually classed into three coping categories: problem focused coping; reference to others, and non-productive coping. Eighteen structured questions are rated by participants on a five-point Likert scale ranging from 'Doesn't apply' to 'Used a great deal'. One open-ended question requires respondents to describe 'other' coping strategies not listed. The ACS contains two parts- 'Specific' and 'General'. The former requires participants to respond to questions given a specific self-nominated concern. The latter assesses how adolescents cope with concerning situations generally. Given time limitations, for the purposes of this study only the ACS General Short Form was used. The ACS General Short Form items have been shown to be moderately correlated with the 18 constructs and 3 scales from which they were derived. Similarly, the 3 scales within the Short Form were shown to be highly correlated, and therefore internally consistent (Frydenberg & Lewis, 1993).

4.3.1.8 Brief sensation-seeking Scale (BSSS) (Hoyle *et al.*, 2002)

The BSSS is an 8-item scale, with four underlying factors (Thrill and adventure seeking, Experience seeking, Disinhibition, and Boredom susceptibility) each represented by 2 items. Respondents indicate agreement using a 5-point Likert scale ranging from 'Strongly disagree' to 'Strongly agree'. The BSSS was developed by combining items from the Sensation-Seeking Scale Form V (SSS-V) (Zuckerman *et al.*, 1978) with items from the SSS-V adapted for adolescents (Huba *et al.*, 1981). This was in order to create a shorter sensation-seeking scale which was more accessible to adolescents and which retained the same content and factor structure as the original SSS-V (Hoyle *et al.*, 2002). As described above, factor analytic studies have shown sensation-seeking to load on an impulsivity factor reflecting 'rash, spontaneous impulsiveness', distinct from another factor of reward sensitivity/ drive, as measured by BAS (Dawe & Loxton, 2004).

Evidence shows that in young non-clinical community-based populations the BSSS successfully retains the four content domains of the original SSS-V (Hoyle *et al.,* 2002). It has good internal consistency across eight to twelfth grade students (Cronbach's α = 0.75-0.78), good convergent validity with the Zuckerman-Kuhlman Personality Questionnaire- Impulsive Sensation-Seeking (Cronbach's α = 0.83), the 2-item BSSS (Cronbach's α = 0.59) and the 4-item BSS (Cronbach's α = 0.89), and good construct validity (Hoyle *et al.,* 2002; Stephenson *et al.,* 2003; Stephenson *et al.,* 1999).

4.3.1.9 Self-Harm Inventory (Schwannauer, Unpublished)

This is a self-report checklist of type, frequency and lethality of past self-harming behaviours, but does not question motivation or intent. Participants are required to indicate whether or not they have engaged in any of 12 self-harming behaviours in the past week and in the past year e.g. 'Have you ever deliberately cut yourself?'. If yes, participants are then asked to rate, using the pre-specified codes, how frequently they have self-harmed (Scale of 0-4, where 0 = never; 1 = once; 2 = 2-10 times; 3 =11-20 times; 4 = > 20 times) and how serious these past episodes have been (Scale of 1-5, where 1= not at all serious and 5 = extremely serious). The 12 DSH behaviours were derived from a grounded theory study with 21 adolescent out-patients who self-harmed. Given that this is an unpublished inventory, there are no reliability and validity studies currently available.

4.3.1.10 Thoughts of self-harm question

Students were also asked, in a separate question, if they had experienced thoughts of self-harm in the last year, and if so, how frequently these thoughts were experienced. They responded on a scale of 1-4, where 1 = never; 2 = daily; 3 = weekly, and 4 = monthly.

4.3.1.11 Self-Injury Motivation Scale (SIMS-II) (Osuch *et al.,* 1999)

The SIMS-II is a measure of the motivation for self-harm. It comprises 36 statements describing possible motivations for self-harm. Participants are required to rate the frequency of relevance of each motivation using an 11-point

Likert scale ranging from 'always' to 'never'. Motivations are then scored on six dimensions: affect modulation; desolation; punitive duality; influencing others; magical control, and self-stimulation. In a sample of fifty adolescent in-patients, the SIMS-II was shown to have adequate to excellent internal reliability across the six dimensions (Kumar *et al.,* 2004). There are no available studies of reliability and validity in a non-clinical adolescent population. Only participants, who answered yes to self-harming at least once in the past year, were required to complete this scale.

4.3.2 Questionnaire format

4.3.2.1 School questionnaire

All measures were combined into one single questionnaire (see Appendix F). Pupils were permitted to skip the final Self-Injury Motivation Scale if they had not indicated previous self-harming behaviour. Order effects were not anticipated because the attachment, mood, personality and self-harm measures were not considered related to one another. Order effects due to duration were also not anticipated due to expected time-to-completion being less than twenty-five minutes (see 4.3.2.3). Self-harm measures were placed at the end.

4.3.2.2 Colleges and universities online questionnaire

The questionnaire was compiled using the website survey-monkey **http://www.surveymonkey.com**. Measures were presented in the same order and format as the school questionnaire (see Appendix F). Students could only proceed through the pages after completing all items for each measure. Logic was applied to the final Deliberate Self-Harm Inventory question, which allowed students to skip the final Self-Injury Motivation Scale if they did not indicate having self-harmed in the past year.

4.3.2.3 Pilot

Four young people completed the paper questionnaire and made comments on readability and format. At their request, clearer instructions were added to the

beginning of all questionnaires. The average time for completion of the questionnaire was 20.5 minutes (range: 18 - 24 minutes).

4.4 Procedure

4.4.1 Power calculation

A power analysis to calculate the sample size necessary to achieve a desired level of power for testing a hypothesis of zero multiple correlation was conducted using the R2.exe computer program (Steiger & Fouladi, 1993). Effect sizes for predictors (following logistic regression) of suicidal behaviour in males (N=55) and females (N=127) were sourced from Eskin *et al.* (2007), that is depression (R^2_{males} =0.49; $R^2_{females}$=0.51), and problem-solving (R^2_{males} =0.55) (Eskin *et al.*, 2007). Using Cohen's standard α level of 0.05, requiring a recommended power of 0.8 (i.e. an 80 per cent chance of detecting a genuine effect if existing), and entering 8 predictor variables, it was estimated that a sample size of 106 per gender group would be required to achieve a medium effect size of 0.13 (R^2).

4.4.2 Ethical considerations

Ethical approval was granted by the University of Edinburgh Clinical Psychology Course Organisation Group (COG). It was not deemed necessary to apply for NHS ethical approval, because this research sample was to be non-NHS based. The Scottish Educational Research Association (SERA) recommended consultation of the Scottish and British Educational Research Association Guidelines (BERA, 1992; SERA, 2005) prior to approaching Directors of Education (see Appendix B).

The Ethical Guidelines for Educational Research recommend the seeking of voluntary informed consent, and/or collaboration with a child's 'guardians' to seek approval, where age or intellectual ability preclude full understanding of this process. It also reinforces the participant's right to withdraw at any time, and the upholding of confidentiality. These measures are in compliance with articles 12

and 13 of the United Nations Convention on the Rights of the Child (i.e. children have the right to a say in what happens to them when adults are making decisions for them, and have the right to access and share information about them, so long as it is not harmful to them or others),

4.4.3 Data collection

4.4.3.1 Schools

Parental opt-out (passive consent) procedures were recommended to schools. By requesting passive consent, researchers assume that parents are willing to allow their children to participate in the research, unless they explicitly request otherwise. Kearney *et al.* (1983) showed that active parental consent procedures resulted in higher attrition rates than with passive consent procedures, because only the most motivated of parents will opt-in to a research study (as cited in Hawton *et al.,* 2006). However, parental opt-out procedures were only used in the state school. Parental opt-in procedures were used in the participating private school, in order to make experimental procedures consistent with procedures used for other activities in the school, which required parent approval.

A briefing of all participating schools was conducted a week before questionnaire administration. This time period was deemed necessary in order that potential participants had more than a day in which to consolidate the study information, consult their parents/guardians and reach an informed decision about participation (BERA, 1992; SERA, 2005).

The briefing was conducted during Personal and Social Education (PSE) classes, with no more than 25 pupils per class. PSE classes are designed to address personal, social and intellectual issues of relevance to young people, for example sex education, religious and moral education, and mental health and well-being issues. The briefing was conducted with approximately 260 pupils across 13 PSE

classes (5 in each of 2 state schools, and 3 in the private school) and was standardised as far as possible across all classes. It included a short explanation of the nature, aims and methods of the study, and the distribution of an information sheet (see Appendix E) and parental opt-out form (see Appendix E). Pupils were told that participation was voluntary, that all data collected would be anonymous and confidential, and that after agreeing to participate they were free to withdraw from the study at any point. Pupils were asked to consult with parents/guardians about participation in the study. If parents did not wish their children to participate, Parental Opt-Out forms were to be signed and returned to teachers. A contact email address (**wellbeingsurvey@gmail.com**) was included at the bottom of the Information Sheet, in case pupils wished to ask questions about the study out-with the briefing session.

On the day of data collection, pupil consent forms were distributed to all pupils in the individual PSE classes (see Appendix E). Those pupils whose parents requested that they not take part were asked to sit and complete an alternative piece of work during the questionnaire administration session (state school) or spent the session reading in the library (private school). Consent forms were collected and placed in a separate box before class teachers distributed questionnaires to all consenting pupils. Pupils were asked to sit as far apart as possible to increase privacy and to refrain from conferring during the session.

At the end of the session, pupils deposited completed questionnaires in a box separate from the completed consent forms. All pupils then received a self-help pamphlet (see Appendix E). This contained the same helpline and website contact details as offered in the online college and university survey. Questionnaire boxes were collected after the session and stored in a locked cabinet within the Clinical Psychology Department office. A drop in session was requested by the private school. The day after data collection, a trainee clinical psychologist was available to pupils in a room in the school for an hour over lunchtime. The state school briefed the resident mental health worker on the content of the survey, in case any

issues were raised by pupils. No pupils in the private school made use of the drop-in session, and the mental health worker did not report an increase in help-seeking pupils.

4.4.3.2 Colleges and universities

A link to the survey was provided in an email sent from an email address set up specifically for the purposes of the study (**wellbeingsurvey@gmail.com**) (see Appendix D). This email address was also included on the introduction and final pages of the web-survey as a point of contact for students with queries in any way relating to the survey and subject matter within. This was consistent with the American Psychological Association (APA) guidelines on best practice for the conducting of internet based research (Kraut *et al.,* 2004). The survey remained 'live' from January 30th 2008 to June 2008, and was accessible 24 hours a day.

The information sheet was added to the first page of the online survey, followed by the standard consent form. Students were made aware that all information was secure, confidential and anonymous (all Internet Protocol (IP) addresses were automatically encrypted to prevent links being made between surveys and addresses). Students were also informed that their participation was voluntary, and that they were free to withdraw from the online survey at any point by clicking on the 'Exit Survey' button at the top of the web page. Students were required to check boxes indicating that they had understood the information given and that they consented to participate, before being able to proceed onto the next page. All questions required completion before being able to proceed to the next page. Where questions were missed, an error message alerted participants to the omitted responses. On completion of the questionnaire, students were directed to a page listing help-lines, relevant websites and the survey email address. Data from all surveys was collected, thus an analysis of incomplete surveys could be conducted.

4.5 Statistical analysis

4.5.1 Data preparation

4.5.1.1 Final data

All 160 briefed pupils consented to participation in the study. In the state school, 10 (7%) of the consenting pupils were removed from the data set: 2 pupils were absent on the day of data collection; 1 pupil was in a careers meeting; 2 pupils declined participation on the day; 3 pupils who consented did not complete any measures, and 2 pupils completed forms which were invalid. In the private school, 13 (22%) of the consenting pupils were removed from the data set: 2 pupils were absent; 1 pupil was in a music lesson; 2 pupils' parents did not permit participation, and 8 pupils failed to return the parental approval slip and were therefore unable to participate. Therefore, 137 (86%) of the possible 160 pupils took part in the study (i.e. 89 state school and 48 private school pupils).

In the online study, 448 individuals consented to participation in the study, of which 14 (3.1%) exited the survey directly after consenting. These cases were removed from the data set. This number may be attributable to university staff checking the nature of the study before permitting the distribution of the link to their students. Therefore 434, (97%) of the possible 448 students took part in the study. Due to anonymity there are no available data on the proportions of student responders from the different colleges and universities.

4.5.1.2 Missing data

In the school sample no more than 11% of data, and in the college sample no more than 25% of data was missing for any one variable (see Tables 5 & 6, Appendix G). Little's Missing Completely at Random (MCAR) t-test was not significant for both school (χ^2 = 171.39, df = 169, p = 0.43) and college (χ^2 = 1020.48, df = 991, p = 0.25) datasets, suggesting that missing data was completely at random. Missing values for predictor variables (i.e. non-DSH and non-categorical variables) were replaced by imputing values estimated by multiple regression.

4.5.1.3 Normality Testing

Kolmogorov-Smirnov and Shapiro-Wilks normality tests were conducted on both data sets. In both datasets all variables (with the exception of sensation-seeking total in the school sample) significantly deviated from normality (see Tables 3 & 4, Appendix G).

4.6 Data analysis

Preliminary exploration of the data including Chi-square Tests of Association, Fishers Exact Test and Mann-Whitney U tests, was performed on both samples and in the combined, samples, separately for males and females. Further statistics including non-parametric bivariate and point biserial correlations were also performed on each sample and on the combined samples separately for males and females. Confirmatory factor analysis was then performed on the combined samples. All statistics were performed using SPSS 15 (SPSS, 2006).

Path analysis was conducted on the combined datasets in EQS for Windows, version 6.1 (Bentler, 1995) and path analysis diagrams were constructed using Visio for Windows (Visio, 2007). Path analysis is a subset of structural equation modelling and is therefore an extension of multiple regression. It is used to examine the hypothesised causal relationships between a set of variables represented within an individual path diagram. The relative sizes of path coefficients enable the identification of paths within the a-priori model which best fit the data (see Tabachnick & Fidell, 2001, Chapter 14).

Covariances are highly sensitive to sample size, thus Comrey and Lee (1992) suggest that for such analyses, a sample size of 100-200 is fair and 300-500 is good (Comrey & Lee, 1992, as cited in Tabachnick & Fidell, 2001). As a result of the modest sample sizes, it was considered prudent to combine both samples in order to increase sample sizes for both genders and therefore more effectively perform the path analysis. Limitations to this process are discussed in chapter 6.

The Satorra-Bentler Scaled χ^2, which is sensitive to non-normal distributions and small sample sizes, was also used to test the fit of the path analysis model. Due to the non-normality of the datasets, medians (Mdn) and ranges are presented instead of means. Effect sizes (Cohen's d) are presented where possible, and Cohen's effect size magnitude interpretations applied (i.e. 0.2 = small effect; 0.5 = medium effect; 0.8 > = large effect). An alpha level of 0.05 was used for all statistical tests.

Chapter 5: Results

5.1 Preliminary data exploration

5.1.1 Demographic data

Of the 137 school participants, 37 (27%) were male (all state school) and 100 (73%) were female (of which 47 were from private school and 53 from state school). Males had an average age of 15.22 years (SD = 0.23, range = 15-17 years) and females 14.89 years (SD=0.40, range = 14-16 years). Two pupils did not indicate their age. There was a significant difference in age between male and female pupils ($t_{(135)} = 4.01$, $p < 0.001$). Of the 434 college/university students, 125 were male (29%) and 302 female (71%). Seven students did not indicate gender. Males had an average age of 18.92 years (SD = 1.12, range = 17-24 years) and females 18.76 years (SD = 0.92, range = 16-24 years). Age did not differ significantly between genders in the online survey sample ($t_{(434)} = 1.65$, $p = 0.10$).

There was therefore a combined total of 571 participants, of which 162 (28%) were male and 402 (70%) were female (7 students did not indicate their gender). Males had an average age 18.07 years (SD = 1.87, range = 15-24 years) and females 17.80 years (SD = 1.87, range = 14-24 years). Age did not differ significantly between genders in the combined sample ($t_{(562)} = 1.60$, $p = 0.11$).

5.1.2 Deliberate self-harm prevalence

For both data sets, a dichotomised categorical variable of DSH status was created (i.e. 'DSH in the past year' versus 'no DSH in the past year'), whereby assignment to the 'DSH in past year' group was based on a 'yes' response to engagement in at least 1 of 12 self-harm acts of the Deliberate Self-Harm Inventory. In the school sample, 30 (21%) participants, and in the online sample 108 (25%) participants did not respond to the question on DSH. It is unclear why

such a large per centage of both samples chose not to respond, however, it is possible that due to the length of the survey, participants may have lost interest and motivation by the time they reached the self-harm measures. Numbers endorsing DSH are described below (see Table 7). In the school sample, DSH status was *not* significantly associated with gender ($\chi^2 = 0.13$, df = 1, $p = 0.71$, d = 0.07). In the online sample and in the combined sample, frequency of DSH status was significantly associated with gender ($\chi^2 = 6.22$, df = 1, $p = 0.01$, d = 0.28; $\chi^2 = 3.89$, df = 1, $p = 0.05$, d = 0.19), such that females were more likely than males to report engaging in DSH.

Table 7: Endorsements of DSH in the past year in males and females in each sample and the merged samples

Gender (sample)	*No. of no DSH (% total sample)*	*No. of DSH (% total sample)*	*Total (N)*
Female (School)	37 (35%)	42 (39%)	79
Male (School)	12 (11%)	16 (15%)	28
Total (School)	49 (46%)	58 (54%)	107
Female (College)	140 (43%)	98 (30%)	238
Male (College)	65 (20%)	23 (7%)	88
Total (College)	205 (63%)	121 (37%)	326
Female (merged)	177 (40.8%)	140 (32%)	317
Male (merged)	77 (18%)	39 (9%)	116
Total (merged)	254 (59%)	179 (41%)	433

5.1.3 Methods of self-harm

The number of participants engaging in a particular type of self-harm is described below (see Table 8). Of the school sample, 9 (8%) participants had self-harmed using a method not listed. These included: digging hairs out of the legs (1 female); hitting the head (1 female); punching objects (1 female); trying to break an arm (1 female); and trying to drown self and jumping in front of a car (1 male). 3 did not list their alternative methods. Of the methods listed in Table 8, only frequency of stabbing as a method was significantly associated with gender (p =

0.043, two-tailed fisher's exact test), such that males were more likely than females to report self-stabbing. Of the online respondents, 18 (5%) participants had self-harmed using a method not listed. These included: making self sick (5 females); not eating (5 females); comfort eating (1 female); picking scabs/cuts (1 female); chewing nails and skin till bleeding (1 female); pulling hairs out (1 female); thinking about a problem over and over again (1 female); smoking excessively (1 female); banging fists on surfaces (1 male); exposing self to elements to induce illness (1 male). 6 did not list their alternative methods. The frequency of types of methods used (as listed in Table 8) was significantly associated with gender for scratching ($\chi^2 = 17.29$, df = 1, $p < 0.001$, d = 0.82), cutting ($\chi^2 = 6.43$, df = 1, $p = 0.01$, d = 0.47), stopping wound healing ($p = 0.002$, two-tailed fisher's exact test), hitting and punching ($\chi^2 = 7.22$, df = 1, $p = 0.007$, d = 0.50) and biting ($p = 0.043$, two-tailed fisher's exact test). Females were more likely than males to use all of these methods of DSH.

Table 8: Number of males (M) and females (F) reporting use of different methods of DSH

Method of DSH	*School* *N= 16M: 42F*	*Total (N)*	*College* *N= 23M: 98F*	*Total (N)*	*Merged*
Overdose of drugs	1M: 3F	4	1M: 5F	6	2M: 8F
Excessive alcohol	6M: 15F	21	15M: 43F	58	21M: 58F
Drank poison/toxic	1M: 0F	1	N/A	0	1M
Burned/ scalded	2M: 4F	5	3M: 8F	11	5M: 12F
Cut skin	5M: 18F	23	**4M: 35F** [a]**	39	9M: 53F
Cut symbols on skin	1M: 8F	9	2M: 5F	7	3M: 13F
Scratches	5M: 26F	31	**3M: 55F** [a]***	58	8M: 81F
Stabbed	**4M: 2F** *	6	0M: 9F	9	4M: 11F
Hit/punched	9M: 16F	25	**5M: 41F** [a]**	46	14M: 57F
Stopped wound-heal	2M: 12F	14	**1M: 36F** [a]**	37	3M: 38F
Biting	5M: 13F	18	**1M: 23F** *	24	6M: 3F

a- χ^2; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.1.4 Repetition of self-harm

The numbers of male and female participants engaging in one or repeat episodes of self-harm in the past year are described below (see Table 9). In both samples, frequency (i.e. once or repeated) was not significantly associated with gender for any methods of DSH.

Table 9: Number of males (M) and females (F) 'repeating' different methods of DSH

DSH > once in past year	*School* *N= 16M: 42F*	*College* *N= 23M: 98F*	*Merged* *N=39M:140F*
Overdose of drugs			
Once	1M: 3F	1M: 5F	2M: 8F
Repeat	0M: 1F	1M: 4F	1M: 5F
Excessive alcohol			
Once	2M: 4F	2M: 7F	4M: 11F
Repeat	4M: 11F	5M: 19F	9M: 30F
Burned/ scalded			
Once	0M: 2F	1M: 4F	1M: 6F
Repeat	2M: 2F	0M: 4F	2M: 6F
Cut skin			
Once	1M: 5F	1M: 6F	2M: 11F
Repeat	4M: 13F	1M: 25F	5M: 38F
Cut symbols on skin			
Once	1M: 6F	1M: 4F	2M: 10F
Repeat	1M: 2F	0M: 2F	1M: 4F
Scratches			
Once	3M: 9F	1M: 5F	4M: 14F
Repeat	2M: 17F	1M: 39F	3M: 56F
Stabbed			
Once	2M: 0F	0M: 6F	2M: 6F
Repeat	1M: 2F	0M: 3F	1M: 5F
Hit/punched			
Once	3M: 7F	1M: 8F	4M: 15F
Repeat	5M: 9F	3M: 24F	8M: 33F
Stopped wound healing			
Once	0M: 7F	0M: 6F	0M: 13F
Repeat	4M: 6F	0M: 20M	4M: 26F
Biting			
Once	0M: 7F	1M: 5F	1M: 12F
Repeat	2M: 6F	0M: 17F	2M: 23F

5.1.5 Motivations for self-harm

In the school sample 37 (27%, 10 males and 27 females) participants, and in the college sample 79 (18%, 13 males and 66 females) participants completed the SIMS-II, all of whom had previously endorsed DSH in the past year. In school pupils, the median score for 'affect regulation' (Mdn = 66) was non-significantly higher than the other five motivation scores and was second highest (Mdn = 62) amongst college students as a whole (after 'magical control'). In school pupils, females reported 'influencing others' as a motivation for DSH (Mdn = 50), significantly more often than males (Mdn = 39) (U = 242.50, z = -2.50, p = 0.005). In the college students, males reported 'magical control' as a motivation for DSH (Mdn = 70), significantly more often than females (Mdn = 65) (U = 242.50, z = -2.50, p = 0.003). None of these differences remained significant in the merged sample.

5.1.6 Self-harm thoughts

A dichotomised categorical variable of DSH thought status was also created (i.e. 'DSH thoughts in the past year' versus 'no DSH thoughts in the past year'). Chi-square tests were then conducted to compare frequencies on categorical variables (i.e. DSH status, DSH thought status, and gender). In the school sample, 15 (19%) participants did not respond to the DSH thoughts question. Due to an error in the online survey, 253 (58%) participants did not respond to the DSH thoughts question. The number of males and females endorsing DSH thoughts and frequency of occurrence of such thoughts in the past year are described in Tables 10 and 11. DSH thought status was *not* significantly associated with gender in the school sample (χ^2 = 0.86, df = 1, p = 0.35, d = 0.17), but was in the college and merged samples (χ^2 = 10.89, df = 1, p < 0.001, d = 0.39; χ^2 = 9.91, df = 1, p = 0.002, d = 0.37), such that a larger proportion of females than males reported DSH thoughts. Frequency of thoughts (i.e. daily, weekly, monthly or occasional) was not significantly associated with gender in the school sample (χ^2 = 4.91, df = 3, p

= 0.18) but was correlated in the college and merged samples (χ^2 = 8.83, df = 3, p = 0.03; χ^2 = 8.78, df = 3, p = 0.03).

There was also a significant association between self-harm thoughts and acts in the past year in males and females in the school sample (χ^2 = 8.40, df = 1, p = 0.004, d = 1.31; χ^2 = 27.03, df = 1, p = 0.001, d = 1.49), the college sample (χ^2 = 9.19, df = 1, p = 0.002, d = 1.11; χ^2 = 41.57, df = 1, p < 0.001, d = 1.29), and the merged sample (χ^2 = 18.97, df = 1, p < 0.001, d = 1.26; χ^2 = 66.99, df = 1, p < 0.001, d = 1.33).

Table 10: Number of males (M) and females (F) endorsing experience of DSH thoughts in the past year

Gender (sample)	*No. with no DSH thoughts (% total sample)*	*No. with 'DSH thoughts (% total sample)*	*Total (N)*
Female (School)	59 (48%)	33 (27%)	
Male (School)	22 (18%)	8 (7%)	
Total (School)	81 (66%)	41 (34%)	122
Female (College)	79 (18%)	63 (35%)	
Male (College)	33 (8%)	6 (3%)	
Total (College)	112 (62%)	69 (38%)	181
Female (Merged)	138 (46%)	96 (32%)	
Male (Merged)	55 (18%)	14 (5%)	
Total (Merged)	193 (64%)	110 (36%)	303

Table 11: Freq of occurrence of DSH thoughts in males (M) and females (F)

Frequency of DSH thoughts	*School N= 8M: 33F*	*College N= 6M: 63F*	*Merged N= 14M: 96F*
Daily	1M: 2F	1M: 3F	2M: 5F
Weekly	3M: 3F	1M: 10F	4M: 13F
Monthly	-	2M: 3F	
Occasional	4M: 28F	2M: 47F	6M: 75F

5.1.7 Relationship Questionnaire (RQ)- attachment styles

Amongst self-harmers, there was no significant association between gender and frequency of reported attachment styles in the college sample ($\chi^2 = 3.01$, df = 3, $p = 0.39$), the school sample ($\chi^2 = 2.06$, df = 3, $p = 0.56$) or the merged samples ($\chi^2 = 1.25$, df = 3, $p = 0.72$)(see Table 12).

Table 12: Main Attachment Style in male (M) and female (F) self-harmers in both samples

Main Attachment Style	*School*	*College*	*Merged*
A (Secure)	7M: 14F	8M: 37F	15M: 51F
B (Insecure: Fearful-Avoidant)	3M: 17F	3M: 25F	6M: 42F
C (Insecure: Preoccupied)	4M: 9F	7M: 17F	11M: 26F
D (Insecure: Dismissive-Avoidant)	1M: 2F	4M: 14F	5M: 16F

5.1.8 Psychological correlates

In school, college and the merged sample of self-harmers, females reported greater levels of non-productive coping than males ($U = 208.50$, $z = -2.22$, $p = 0.03$; $U = 830.50$, $z = -1.96$, $p = 0.05$; $U = 1907.50$, $z = -2.88$, $p = 0.004$). Male school self-harmers reported greater levels of depression than females ($U = 1132.50$, $z = -1.87$, $p = 0.06$), but this difference was not significant. Female college self-harmers and female self-harmers in the merged sample reported greater levels of anxiety than males ($U = 594.50$, $z = -3.52$, $p < 0.001$; $U = 2080.00$, $z = -2.28$, $p = 0.02$). Female self-harmers in the school and merged samples also reported significantly greater levels of BIS than the males, although this was non-significant in the school sample ($U = 861.50$, $z = -1.75$, $p = 0.07$; $U = 2038.50$, $z = -2.42$, $p = 0.01$). The same groups also reported greater levels of sensation-seeking (SS) – experience than the males, but again this did not reach significance in the school sample ($U = 858.00$, $z = -1.79$, $p = 0.07$; $U = 2030.00$, $z = -2.47$, $p = 0.01$) (see Table 13).

Table 13: Psychological correlates in male (M) and female (F) self-harmers

Correlates of DSH	*Females (School) N=42*	*Males (School) N=16*	*Females (College) N=98*	*Males (College) N=23*	*Females (Merged) N=140*	*Males (Merged) N=39*
	Median (Range)		Median (Range)		Median (Range)	
Care- mum	28.00 (25)	22.50 (25)	18.00 (15)	18.00 (8)	19.00 (27)	19.00 (25)
Overprotect-mum	13.00 (28)	13.00 (23)	20.57 (18)	21.00 (13)	20.00 (26)	19.00 (28)
Care- dad	24.00 (35)	22.06 (33)	19.00 (14)	19.00 (11)	20.00 (35)	20.00 (33)
Overprotect-dad	14.00 (26)	15.00 (34)	22.00 (15)	21.00 (17)	21.00 (26)	21.00 (34)
BIS	22.00 (14)	21.00 (15)	*23.00 (16)*	*22.00 (17)*	**23.00 (16)**	**22.00 (16)***
BAS Total	40.26 (27)	40.50 (20)	39.00 (23)	40.00 (21)	40.00 (27)	40.00 (23)
BAS Drive	10.50 (11)	11.47 (9)	10.00 (12)	10.00 (11)	10.00 (12)	10.00 (11)
BAS Fun	13.00 (11)	13.00 (8)	11.96 (8)	12.00 (9)	12.00 (11)	13.00 (9)
BAS Reward	17.00 (10)	16.54 (6)	17.00 (7)	17.00 (8)	17.00 (10)	17.00 (8)
SS Total	20.00 (24)	16.00 (26)	21.65 (26)	20.00 (20)	21.00 (26)	20.00 (26)
SS Experience	5.00 (7)	3.50 (8)	*5.00 (6)*	*3.52 (7)*	**5.00 (7)**	**4.00 (8)***
SS Boredom	5.00 (7)	4.00 (5)	5.00 (7)	5.00 (7)	5.00 (7)	5.00 (7)
SS Thrill/	5.00 (8)	5.00 (8)	6.00 (8)	6.00 (7)	6.00 (8)	6.00 (8)
SS Disinhibition	5.00 (6)	4.00 (6)	6.00 (8)	6.00 (8)	5.00 (8)	6.00 (8)
BHS	5.00 (18)	4.00 (16)	4.00 (19)	3.00 (15)	5.00 (19)	3.00 (16)
Anxiety	11.00 (15)	11.50 (12)	**8.34 (17)**	**5.58 (13)****	**8.00 (15)**	**6.00 (14)***
Depression	*4.00 (8)*	*6.10 (12)*	3.33 (13)	3.67 (14)	2.00 (11)	3.00 (11)
Problem-solving	60.00 (75)	60.00 (54)	57.00 (57)	60.00 (51)	60.00 (75)	60.00 (57)
Ref to others	50.00 (75)	45.00 (55)	45.00 (70)	40.00 (50)	50.00 (75)	45.00 (60)
Non- Productive	**61.00 (68)**	**51.94 (52) ***	**58.00 (42)**	**54.00 (42)***	**58.00 (72)**	**52.00 (54)****

Mann-Whitney U significance level: $*p < 0.05$ $** p < 0.01$ $*** p < 0.001$

5.2 Statistical analysis

5.2.1 Inter-correlations and correlations

5.2.1.1 Inter-correlations

Non- parametric Spearman's rho (r_s) rank correlations were performed to explore the inter-relationships between psychological factors separately in male and female self-harmers in each sample, and in the combined samples (see Tables 14 - 19, Appendix H). Only those inter-correlations included in the hypotheses are presented below.

5.2.1.1.1 Emotional distress

Depression and anxiety were positively correlated in the college and combined sample in the females ($r_{s\ (96)} = 0.40, p < 0.001$; $r_{s\ (138)} = 0.39, p < 0.001$) and in the male merged sample ($r_{s\ (37)} = 0.45, p = 0.004$). Depression and hopelessness were also positively correlated in the school, college and merged samples for females ($r_{s\ (40)} = 0.53, p < 0.001$; $r_{s\ (96)} = 0.43, p < 0.001$; $r_{s\ (138)} = 0.47, p < 0.001$) and males ($r_{s\ (14)} = 0.56, p < 0.001$; $r_{s\ (21)} = 0.66, p < 0.001$; $r_{s\ (37)} = 0.64, p < 0.001$). Finally, anxiety and hopelessness were positively correlated in the school, college and merged samples for females ($r_{s\ (40)} = 0.39\ p = 0.01$; $r_{s\ (96)} = 0.35, p < 0.001$; $r_{s\ (138)} = 0.39, p < 0.001$) and college and combined samples for males ($r_{s\ (21)} = 0.44$, $p = 0.04$; $r_{s\ (37)} = 0.33, p = 0.04$).

5.2.1.1.2 BIS/BAS

There were no significant associations between BIS and emotional distress in males. BIS was positively associated with anxiety (but not depression) in the school, college and combined samples in females ($r_{s\ (40)} = 0.49, p < 0.001$; $r_{s\ (96)} = 0.35, p < 0.001$; $r_{s\ (138)} = 0.36, p < 0.001$), and with hopelessness in the school sample in females ($r_{s} =_{(40)} 0.34, p = 0.03$). In the merged sample in females, BAS was negatively associated with depression ($r_{s\ (138)} = -.20, p = 0.02$) and hopelessness ($r_{s\ (138)} = -.21, p = 0.01$). In the college and combined male samples, BAS was negatively associated with depression ($r_{s\ (21)} = -.60, p = 0.003$; $r_{s\ (37)} = -.38, p = 0.02$), anxiety (in the college sample only) ($r_{s\ (21)} = -.60, p = 0.002$) and with hopelessness in the school, college and combined male samples ($r_{s\ (14)} = -.75$, $p < 0.001$; $r_{s\ (21)} = -.47, p = 0.02$; $r_{s\ (37)} = -.57, p < 0.001$).

5.2.1.1.3 PBI care and overprotection

In the female school sample, maternal care was negatively associated with BIS ($r_{s\ (40)} = -.36, p = 0.03$), while paternal care was negatively associated with hopelessness ($r_{s\ (40)} = -.40, p = 0.04$) and positively associated with BAS ($r_{s}\ (40) = 0.47, p = 0.01$). Paternal overprotection was also positively associated with anxiety ($r_{s\ (40)} = 0.38$, p = 0.01). In the female college sample, maternal overprotection was negatively associated with BAS ($r_{s\ (96)} = -.22, p = 0.05$).

In the male school sample, paternal care was negatively associated with both depression and anxiety ($r_{s\ (14)} = -.64$, $p = 0.05$; $r_s = -.62$, $p = 0.02$), while maternal care was also negatively associated with anxiety ($r_{s\ (14)} = -.73$, $p = 0.03$), and depression, although the latter did not reach significance. There were no significant associations with parental overprotection in males.

5.2.1.2 Point biserial correlations for DSH status and correlates

Point biserial correlations were conducted to explore the relationship between psychological correlates and DSH (discrete dichotomous variable) separately for males and females in each sample and in the combined samples (see Tables 20 - 21).

Table 20: Point biserial correlations (and effect sizes) between DSH status and correlates of DSH for females in school and college/university samples separately and together

Correlates of DSH	*Females (School) N=79*		*Females (College) N=238*		*Females (Merged) N=317*	
	r	*Effect size (d)*	*r*	*Effect Size (d)*	*r*	*Effect Size (d)*
Care- mum	**-0.25***	-0.52	-0.08	-0.16	-0.02	-0.04
Overprotect-mum	**0.33****	0.70	-0.17	-0.34	0.01	0.02
Care- dad	**-0.33** **	-0.70	0.03	0.06	-0.06	-0.12
Overprotect-dad	**0.31****	0.65	0.02	0.04	0.01	0.02
BIS	0.00	0.00	**0.13** *	0.26	0.09	0.18
BAS	0.03	0.06	-0.05	-0.10	-0.02	-0.04
BAS Drive	0.03	0.06	**-0.14***	-0.28	-0.09	-0.18
BAS Fun	0.17	0.34	-0.05	-0.10	0.02	0.04
BAS Reward	-0.14	-0.28	0.09	0.18	0.04	0.08
Sensation-seeking (SS)	**-0.33** **	-0.70	0.05	0.10	-0.05	-0.10
SS Experience	-0.18	-0.36	0.09	0.18	0.03	0.06
SS Boredom	**-0.28** *	-0.58	-0.01	-0.02	-0.08	-0.16
SS Thrill/adventure	-0.20	-0.41	0.07	0.14	-0.01	-0.02
SS Disinhibition	**-0.37** **	-0.80	0.00	0.00	**-0.11** *	-0.22
BHS	**0.36****	0.77	0.04	0.08	**0.12** *	0.24
Anxiety	**0.48** ***	1.09	-0.03	-0.06	0.10	0.20
Depression	**0.36*****	0.77	-0.12	-0.24	-0.01	-0.02
Problem solving	**-0.28****	-0.58	**-0.25** **	-0.52	**-0.24** **	-0.49
Reference to others	-0.20	-0.41	**-0.14** *	-0.28	**-0.11** *	-0.22
Non- Productive Coping	**0.55*****	1.32	**0.26** **	0.54	**0.35** **	0.75

*$p<0.05$ ** $p<0.01$ *** $p<0.001$

Table 21: Point biserial correlations between DSH status and correlates of DSH for males in school and college/university samples separately and together

Correlates of DSH	*Males (School) N=28*		*Males (College) N=88*		*Males (Merged) N=116*	
	r	*Effect Size (d)*	*r*	*Effect Size (d)*	*r*	*Effect Size (d)*
Care- mum	0.36	0.77	-0.05	-0.10	0.04	0.08
Overprotect-mum	-0.27	-0.56	0.01	0.02	-0.11	-0.22
Care- dad	**0.43** *	0.95	0.67	1.80	0.03	0.06
Overprotect-dad	**-0.49** *	-1.12	-0.03	-0.06	-0.04	-0.08
BIS	-0.32	-0.67	-0.10	-0.20	0.01	0.02
BAS	-0.11	-0.22	0.07	0.14	0.12	0.24
BAS Drive	-0.10	-0.20	0.34	0.72	0.09	0.18
BAS Fun	-0.25	-0.52	0.60	1.50	0.13	0.26
BAS Reward	0.13	0.26	0.08	0.16	0.06	0.12
Sensation-seeking (SS)	**0.51** **	1.18	0.04	0.08	-0.13	-0.26
SS Experience	**0.44** *	0.98	0.03	0.06	-0.06	-0.12
SS Boredom	**0.51** **	1.18	0.00	0.00	-0.14	-0.28
SS Thrill/adventure	0.28	0.58	0.11	0.22	-0.02	-0.04
SS Disinhibition	**0.39** *	0.85	-0.02	-0.04	-0.15	-0.30
BHS	**-0.46** *	-1.03	-0.15	-0.30	0.12	0.24
Anxiety	**-0.57** **	1.34	**-0.34***	-0.72	-0.04	-0.08
Depression	**-0.49** **	1.12	-0.08	-0.16	0.11	0.22
Problem solving	0.28	0.58	-0.04	-0.08	-0.08	-0.16
Reference to others	-0.19	-0.39	-0.09	-0.18	0.04	0.08
Non- Productive Coping	**-0.45***	-1.00	0.17	0.34	**0.25** **	0.52

*$p<0.05$ ** $p<0.01$ *** $p<0.001$

5.2.1.3 Point biserial correlations between DSH thoughts and correlates

Point biserial correlations were also conducted to explore the relationship between correlates and DSH thoughts (discrete dichotomous variable), separately for males and females, but only in the merged sample due to the small sample numbers. The results are detailed below (no tables are available for this data).

In the female merged sample, DSH thoughts status was positively correlated with maternal and paternal overprotection ($r_{pb\ (230)} = .16$, $p = 0.01$; $r_{pb\ (230)} = .21$, $p = 0.002$), anxiety ($r_{pb\ (230)} = .01$, $p = 0.02$) and non-productive coping ($r_{pb\ (230)} = .31$, $p < 0.001$). Status was negatively correlated with paternal care ($r_{pb\ (230)} = -.10$, $p = 0.004$), sensation-seeking- total ($r_{pb\ (230)} = -.13$, $p = 0.05$) and problem-solving coping ($r_{pb\ (230)} = -.26$, $p < 0.001$). In the male merged sample, DSH thoughts status was positively correlated with non-productive coping ($r_{pb\ (69)} = .39$, $p < 0.001$) and negatively correlated with problem-solving coping ($r_{pb\ (69)} = -.29$, $p = 0.01$).

5.2.2 Confirmatory factor analysis

To generate an optimum model for the data, confimatory factor analysis was performed on the merged samples (N= 571) using maximum likelihood extraction with varimax rotation. Attachment variables were not included in the analysis due to the lack of significant correlations with DSH in the college sample.

The Kaiser-Meyer Olkin Measure (KMO) of Sampling Adequacy was mediocre (KMO = 0.62), suggesting that factor analysis was appropriate for this data. Similarly, Bartlett's Test of Sphericity was significant ($\chi^2 = 640.96$, df = 36, $p < 0.001$), indicating that relationships between variables to be included were significant and that factor analysis was appropriate for this data. An absence of values greater than 0.90 in the correlational matrix showed an absence of multicollinearity (see Table 22).

Table 22: Correlational matrix for merged samples

Correlation Matrix[a]

		BIS_TOTAL	BAS_Total	SS_TOTAL	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
Correlation	BIS_TOTAL	1.00	-.071	.201	.159	.365	.104	-.143	.069	.090
	BAS_Total	-.071	1.00	-.369	-.226	-.102	-.130	.086	.078	.036
	SS_TOTAL	.201	-.369	1.00	.072	.007	.053	-.048	-.032	-.104
	BHSTOTAL	.159	-.226	.072	1.00	.448	.474	-.065	-.042	.126
	HADSA_2	.365	-.102	.007	.448	1.00	.426	-.089	.066	.171
	HADSD_2	.104	-.130	.053	.474	.426	1.00	-.063	.047	.050
	SP_ADJUSTED	-.143	.086	-.048	-.065	-.089	-.063	1.00	.243	-.076
	RO_ADJUSTED	.069	.078	-.032	-.042	.066	.047	.243	1.00	.073
	NPC_ADJUSTED	.090	.036	-.104	.126	.171	.050	-.076	.073	1.00
Sig. (1-tailed)	BIS_TOTAL		.046	.000	.000	.000	.006	.000	.051	.016
	BAS_Total	.046		.000	.000	.007	.001	.020	.031	.195
	SS_TOTAL	.000	.000		.043	.438	.102	.127	.223	.007
	BHSTOTAL	.000	.000	.043		.000	.000	.060	.161	.001
	HADSA_2	.000	.007	.438	.000		.000	.016	.059	.000
	HADSD_2	.006	.001	.102	.000	.000		.068	.131	.118
	SP_ADJUSTED	.000	.020	.127	.060	.016	.068		.000	.035
	RO_ADJUSTED	.051	.031	.223	.161	.059	.131	.000		.041
	NPC_ADJUSTED	.016	.195	.007	.001	.000	.118	.035	.041	

a. Determinant = .322

SS_Total= sensation-seeking; BHSTOTAL = Hopelessness; HADSA_2= Anxiety; HADSD_2 = Depression; SP_Adjusted = Problem Solving; RO_Adjusted = Reference to Others Coping; NPC_Adjusted = Non-Productive Coping

Communalities after extraction showed that between 42% and 73% of the variance associated with each variable was shared variance (see Table 23).

Four factors were identified in the analysis: (1) - emotional distress (depression, (.655) anxiety (.633) and hopelessness (.702)); (2) - impulsivity (sensation-seeking (.755) and BAS (-.497)); (3) - coping (problem-solving (.272) and reference to others (0.984)), and (4) - avoidance (BIS (.797) and anxiety (.349)) (see Table 24).

Table 23: Communalities after extraction

	Extraction
BIS_TOTAL	.714
BAS_Total	.592
SS_TOTAL	.728
BHSTOTAL	.687
HADSA_2	.663
HADSD_2	.675
SP_ADJUSTED	.687
RO_ADJUSTED	.711
NPC_ADJUSTED	.420

SS_Total= sensation-seeking; BHSTOTAL = Hopelessness; HADSA_2= Anxiety; HADSD_2 = Depression; SP_Adjusted = Problem Solving; RO_Adjusted = Reference to Others Coping; NPC_Adjusted = Non-Productive Coping

Table 24: Rotated factor matrix for merged sample of males and females

	Factor			
	1	2	3	4
BHSTOTAL	.702			
HADSD_2	.655			
HADSA_2	.633			.349
NPC_ADJUSTED				
RO_ADJUSTED		.984		
SP_ADJUSTED		.272		
SS_TOTAL			.755	
BAS_Total			-.497	
BIS_TOTAL				.797

SS_Total= sensation-seeking; BHSTOTAL = Hopelessness; HADSA_2= Anxiety; HADSD_2 = Depression; SP_Adjusted = Problem Solving; RO_Adjusted = Reference to Others Coping; NPC_Adjusted = Non-Productive Coping

5.2.3 Path analysis

Path Analysis was performed on the merged samples. The relationships were examined between emotional distress, a latent variable with three indicators (depression, anxiety and hopelessness); impulsivity, a latent variable with two indicators (BAS and sensation-seeking); adaptive coping, a latent variable with two indicators (problem-solving and reference to others); maladaptive coping, a latent variable with two indicators (BIS and non-productive coping) and DSH, a measured variable (see Figure 2). The fit of the model was tested with the Satorra-Bentler Scaled χ^2, (for non-normal distributions and small sample sizes), for which $p > .05$ is considered a good fit (Bentler & Yuan, 1999). Due to the latter's sensitivity to sample size, the root mean square error of approximation (RMSEA) and the comparative fit index (CFI) were also used as estimates of overall model fit. An RMSEA of between 0 and 0.05 is considered good and between 0.05 and 0.08 an acceptable fit, and a CFI of between 0.85 and 1 is considered a good fit.

5.2.3.1 Hypothesised model in females

The overall fit of the hypothesised model for females was good ($\chi^2 = 59.86$, df = 29, $p < 0.001$; CFI = 0.91; RMSEA = 0.06; 90% confidence interval = 0.04 - 0.08) (see Figure 2). Emotional distress was a significant predictor of DSH in females (standardised coefficient = .48). This relationship was however completely mediated by maladaptive coping (i.e. BIS and non-productive coping) (standardised coefficient = .85 and .84) and to a lesser extent by impulsivity (i.e. sensation-seeking and BAS) (standardised coefficient = .27 and -.06) and adaptive coping (i.e. reference to others and problem-solving) (standardised coefficient = -.16 and .23). A table of standardised coefficients can be found in Table 25, Appendix H.

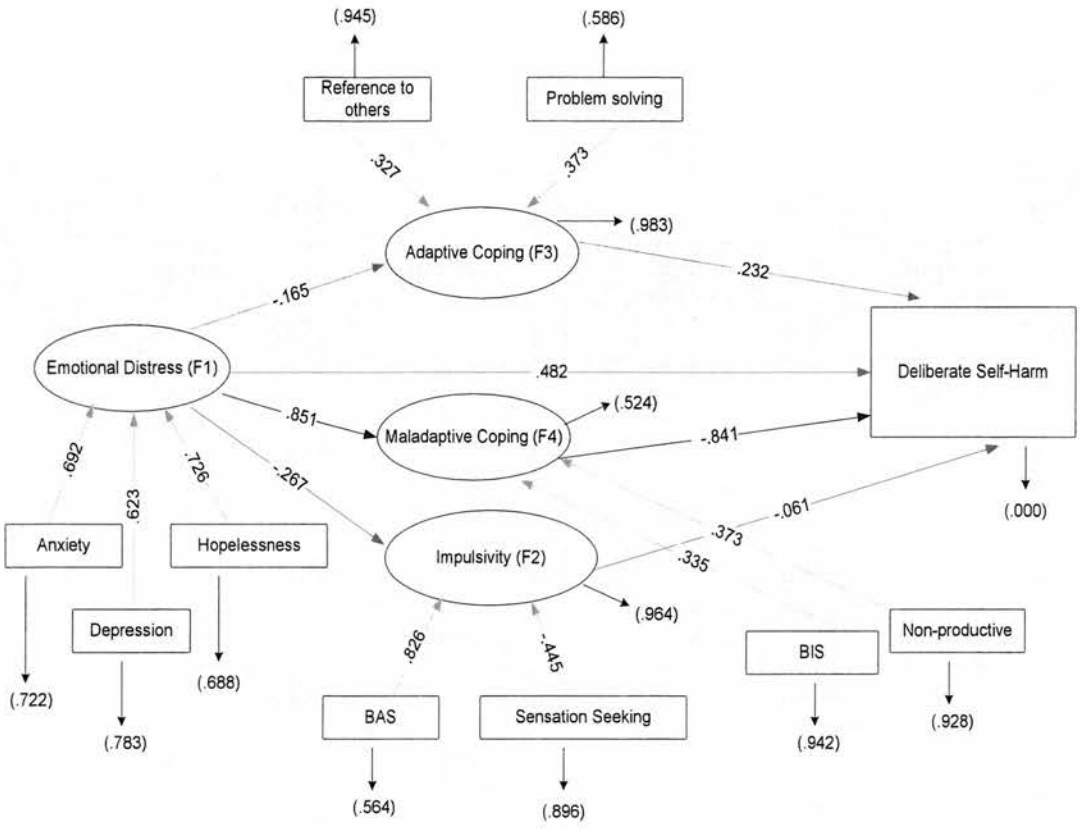

Figure 2: Hypothesised and final model for females

Coloured lines are merely indicative of individual paths

Values refer to standardised path coefficients. Values in brackets are error terms.

5.2.3.2 Hypothesised model in males

The same hypothesised model tested in the females (see Figure 3) was tested in the merged male sample. The overall fit of this model for males was not satisfactory (χ^2 = 86.53, df = 28, p = 0.01; CFI = 0.63; RMSEA = 0.14; 90% confidence interval = 0.10- 0.17) (see Figure 3). A table of standardised coefficients can be found in Table 26, Appendix H. Scrutiny of the Wald test, which identifies parameters for deletion in order to improve the model fit, suggested that removal of 'reference to others coping' from factor 3 and insertion into factor 4- maladaptive coping, and removal of anxiety from factor 1 and insertion into factor 2- impulsivity, would maximise the model fit.

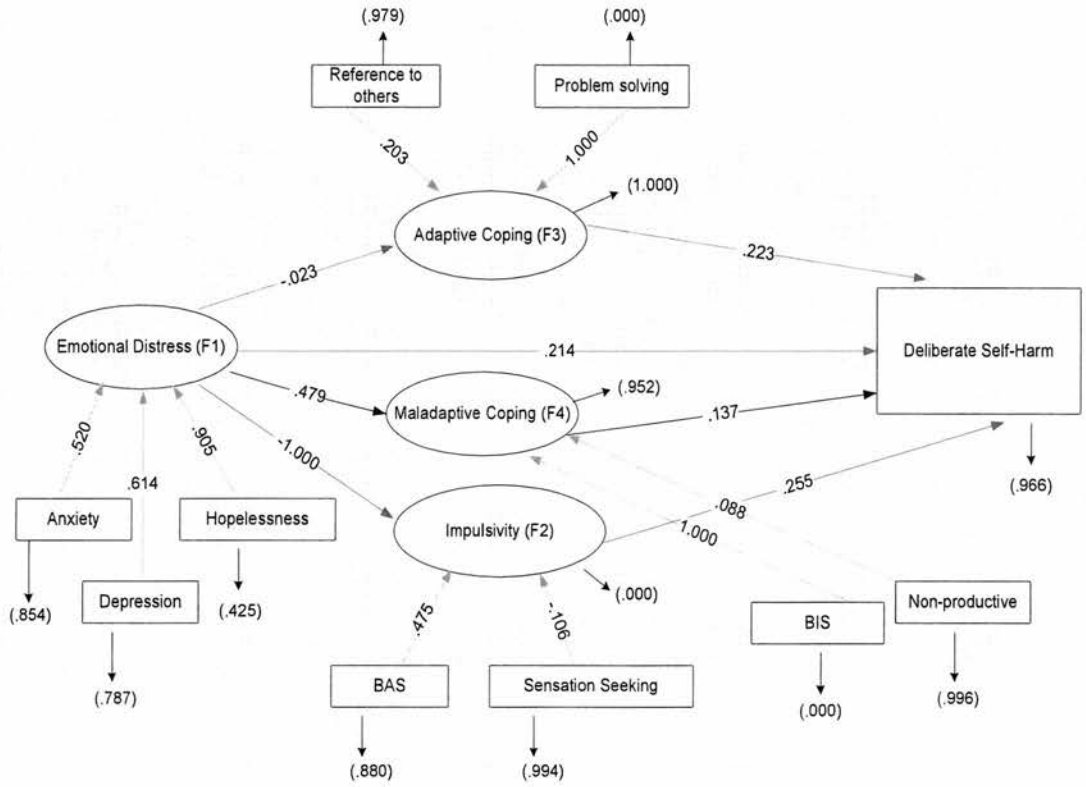

Figure 3: Hypothesised model for males

Coloured lines are merely indicative of individual paths

Values refer to standardised path coefficients. Values in brackets are error terms.

5.2.3.3 Final model for males

An alternative model therefore included anxiety within the impulsivity factor and reference to others within the maladaptive coping factor. The overall fit of this model for males was very good (χ^2 = 37.81, df = 30, p = 0.15; CFI = 9.34; RMSEA = 0.05; 90% confidence interval = 0.00-0.090) (see Figure 4). There was a direct relationship between emotional distress (i.e. depression and hopelessness) (standardised coefficient = .64) and DSH, which was completely mediated by impulsivity (i.e. BAS, sensation-seeking and anxiety) (standardised coefficient = .30 and .79) and to a lesser extent by problem-solving coping (standardised

coefficient = .02 and .27). There was no longer a direct relationship between maladaptive coping and self-harm. Interestingly however, there was a relationship between impulsivity and maladaptive coping (standardised coefficient = -0.05). A further test of the model *without* this correlation showed a poorer fit of the model to the data (CFI = 0.851) (see Table 27, Appendix H). This suggests that the level of maladaptive coping strengthens the link between impulsivity and DSH in males. A table of standardised coefficients can be found in Table 28, Appendix H.

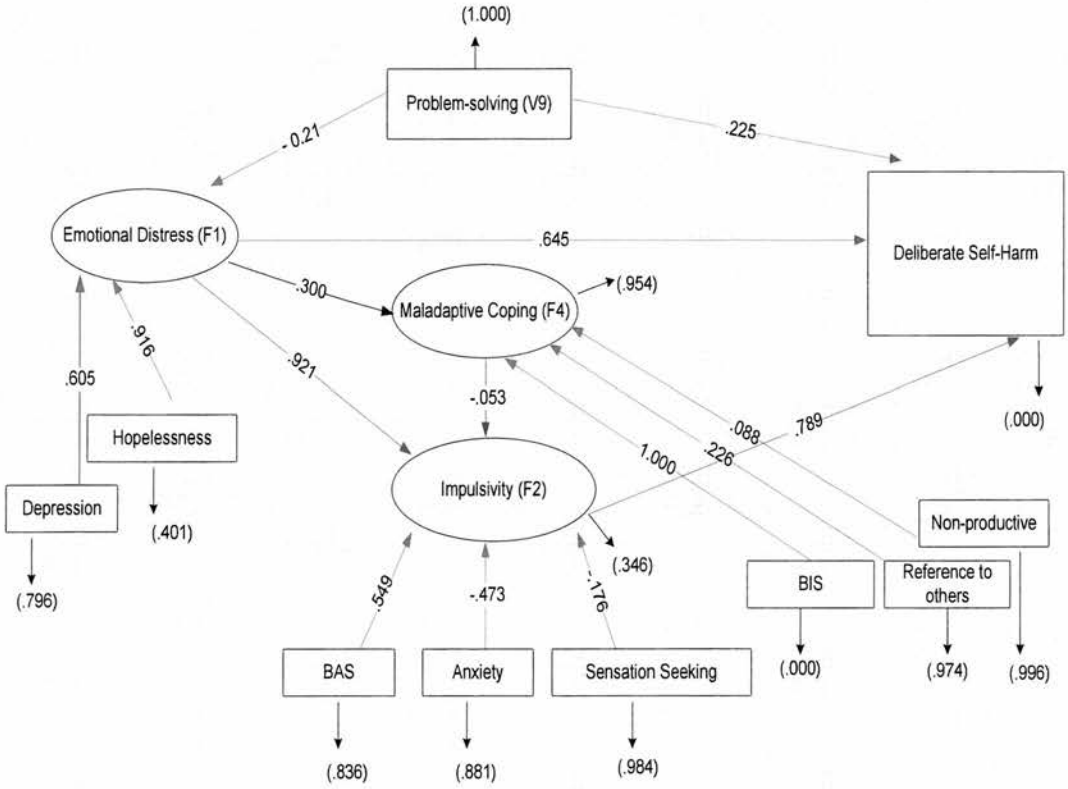

Figure 4: Final model for males

Coloured lines are merely indicative of individual paths

Values refer to standardised path coefficients. Values in brackets are error terms.

5.3 Summary of results

5.3.1 Nature of DSH in study samples

Our results showed that a large number of adolescents reported engagement in DSH in the past year, namely 54 per cent of the school sample, and 37 per cent of the online sample (41 per cent overall). Moreover, a greater proportion of females relative to males reported engagement in self-harming behaviour, repetition of such behaviour, and in the college and merged samples, use of methods such as self-cutting, scratching, hitting, biting, and interfering with wound-healing. Conversely, males in the school sample were more likely than females to report self-stabbing. Alcohol was the most popular method of self-harm employed by males. A smaller number of participants, who had self-harmed, completed the self-harm motivation scale. However, 'affect regulation' was the most common motivation for self-harm in both samples. Females were also more likely than males to report 'influencing others' and males more likely than females to report 'magical control' as motivations for self-harm. More females than males also endorsed experiencing self-harming thoughts in the past year (although this was not significant in the school sample).

5.3.2 Psychological correlates of DSH in study samples

In both male and female self-harmers median depression and hopelessness scores were well below the recommended cut-off scores for probable difficulties, suggesting that in general, this sample of adolescent self-harmers were not experiencing clinically significant levels of depression or hopelessness. However, in male and female school (but not college) self-harmers, median anxiety scores showed clinically significant and equivalent levels of anxiety. Anxiety in the female college self-harmers was statistically significantly greater than in the males (see Table 13).

Female self-harmers in both samples also reported greater levels of non-productive coping than males (e.g. worry; wishful thinking; avoiding problem; self-blame; letting off steam by drinking, crying etc), and female college self-

harmers reported greater levels of behavioural inhibition and (conversely) sensation seeking- 'experience' (e.g. the desire to explore strange places and to have new and exciting experiences) than males (see Table 13).

5.3.3 Correlations and inter-correlations

With respect to each of the experimental hypotheses the results can be summarised a follows.

Hypothesis 1: Consistent with hypothesis one, depression, anxiety and hopelessness were all positively correlated with one another in male and female self-harmers. However, only depression and anxiety were positively correlated with DSH in the female school sample, while only hopelessness was significantly positively correlated with DSH in the combined female sample only. Also inconsistent with the first hypothesis, in the male school and college samples (but not the combined sample), anxiety was negatively correlated with DSH. In addition, only anxiety was significantly positively correlated with DSH thoughts in the female merged sample.

Hypothesis 2: Contrary to the second hypothesis, BIS was significantly positively correlated with anxiety and hopelessness in females *only*, and there were no associations with depression. BAS was however negatively associated with depression and hopelessness in both male and female self-harmers, but with anxiety in male college self-harmers only.

Hypothesis 3: Consistent with the third hypothesis, BIS was significantly positively correlated with self-harm in female but not male students (although this was not evident in the school or combined sample).

Hypothesis 4: Consistent with the fourth hypothesis, sensation-seeking was significantly correlated with self-harm in male pupils but negatively correlated in female pupils (although this was not significant in the college or combined samples). In addition, DSH thoughts were also negatively correlated with sensation-seeking in the female merged sample.

Hypothesis 5: Consistent with the fifth hypothesis, non-productive coping was positively associated with self-harm in both males and females in the combined sample. However, female self-harmers reported greater levels of non-productive coping than male self-harmers, and non-productive coping was differentially correlated with self-harm in male and female self-harmers in the school sample (i.e. a significant positive correlation between the two in females, but a significant negative correlation between the two in males). In addition, the same associations were evident for DSH thoughts in both genders in the merged sample.

Hypothesis 6: In support of the sixth hypothesis, problem-solving coping was more strongly related to self-harm in females than in males. In addition, problem-solving was negatively associated with DSH thoughts in both genders in the merged sample.

Hypothesis 7: There was however no support for the seventh hypothesis, as reference-to-others coping was significantly negatively associated with self-harm in females *but not* males.

Hypothesis 8: Consistent with the eighth hypothesis, parental overprotection was significantly positively associated with self-harm in females, and negatively associated with self-harm in males, whilst parental care was positively associated with self-harm in males and not females, but only in the school sample. In addition, the same associations were evident for DSH thoughts in the merged sample for females only.

Hypothesis 9: There was no support for the ninth hypothesis. In female school self-harmers, paternal care was positively associated with BAS. There were no relationships between care and BIS/BAS in the male school self-harmers. Paternal overprotection was positively correlated with anxiety in the female school self-harmers, while maternal overprotection was negatively correlated with BAS in female college self-harmers. There were no relationships with overprotection in any of the male samples. However, parental care was negatively associated with depression and anxiety in male school self-harmers.

5.3.4 Path analysis

Due to a lack of correlations between self-harm and parental bonding in the college sample, the PBI variables were not included in the path models.

Hypothesis 10: In the final path models in females and males, there was a direct association between self-harm and emotional distress. This association was partially mediated by adaptive coping in both genders (i.e. pro-social and problem solving in females, and problem-solving in males). However, the relationship between distress and self-harm was fully mediated in females by maladaptive coping (BIS and non-productive coping) and in males by impulsivity (with anxiety). The latter effect was strengthened by the relationship between maladaptive coping (BIS, non-productive coping and reference to others), and impulsivity. This therefore led to a rejection of the null hypothesis that no differences exist in the fit and coefficients of the hypothesised model in male and female samples.

Chapter 6: Discussion

6.1 Conclusions

This study was an investigation of psychological factors associated with self-harm in a non-clinical adolescent male and female population. This is therefore an important addition to the literature because a significant proportion of previous research has focused on self-harm in clinical in and out-patient groups, and often without reference to gender differences. Moreover, there are no other known studies which have investigated the relationships between emotional distress, BIS/BAS, sensation seeking, coping and their interaction to predict self-harm in a non-clinical community-based adolescent population. The finding of differential relationships between factors associated with self-harm in males and females is encouraging, and as such, it is anticipated that these findings will make a unique contribution to the extant literature in this area.

6.1.1 Results in relation to current research

While our finding of a 41 per cent prevalence rate for DSH in the past year across both samples is relatively consistent with more recent research in school and college samples, it remains at the higher end of those rates quoted in the literature (Allison *et al.,* 1995; Bjarehed & Lundh, 2008; Brown *et al.,* 2007b; Gratz *et al.,* 2002; Izutsu *et al.,* 2006; Lloyd-Richardson *et al.,* 2007; Lundh *et al.,* 2007). As previously discussed, prevalence rates are typically highly variable as a result of the use of different measurements of DSH across studies. The prevalence rate of 54 per cent in the school sample alone will have contributed significantly to this overall rate, but the former cannot be considered representative, due to being based on reports from a small sample of pupils in only two schools, of which one was single sex (female). Nonetheless, this further highlights the underestimation of rates of self-harm when based solely upon presentation to hospitals and

primary-care mental health services (e.g. estimated 6.5 per cent prevalence rate, Camelot-Foundation, 2006).

The finding that females were more likely than males to report DSH in the past year, to repeat such behaviour, and to report suicidal ideation, is also consistent with the literature (e.g. Edwards & Holden, 2001; Hawton *et al.,* 2002; Ross & Heath, 2002; Walsh & Eggert, 2007; Whitlock *et al.,* 2006a). However, surprisingly, this gender difference in prevalence of DSH thoughts and acts did not reach significance in the school sample, possibly due to limited statistical power, but is nonetheless the reverse of that pattern indicated in the literature (i.e. that gender differences in rates are reduced in late adolescence) (Tousignant *et al.,* 1993; Wunderlich *et al.,* 2001).

Self-harm ideation is recognised as an important precursor to DSH, and these results further emphasise the importance of cognitions in DSH. Moreover, despite a small number of participants responding to this question (as a result of an error in the online survey), associations of DSH thoughts with psychological correlates were similar to those between psychological correlates and DSH acts. Of note however, was the positive relationship with anxiety, parental overprotection and care in females but not males. This tentatively suggests that family relationships and anxiety have a greater influence on DSH thoughts in females than in males, a finding supported by previous evidence (Miller & Day, 2002). This area therefore warrants further investigation.

Our finding that females were more likely than males to endorse 'influencing others' as a motivation for DSH (e.g. 'to show others how hurt I am; to seek support and caring from others; to express anger; to shock others'), while males were more likely to endorse 'magical control' (e.g. 'to control the reactions of others; to protect those important to me; to prevent myself from hurting someone else; to kill a part of myself; to control parts of myself'), was of interest. It could be tentatively suggested that these motivations are in keeping with gender-typical

responses to distress, where females are motivated by a need to share their emotions with others, while males are motivated by a need for control over their own actions and the reactions of others. These findings should however be interpreted with caution, due to the small number who completed the SIMS-II.

The finding of clinically non-significant levels of depression in both males and females is consistent with some literature which suggests that depression is not sustained in adolescent self-harmers, is equivalent to levels of distress reported in non-self-harming adolescents or is not associated with sub-clinical self-harming behaviour (e.g. skin picking) (Croyle & Waltz, 2007; Harrington, 2001; Harrington *et al.,* 2000; Jacobson & Gould, 2007; Jacobson *et al.,* 2008). This is an important finding because it implies that such young people, who are typically reluctant to seek help for self-harming behaviour, may not otherwise come to the attention of services.

Anxiety was only 'clinically' significant in the school sample, but females reported greater levels of symptoms than males in the college sample. Moreover, anxiety was positively associated with self-harm in the females but not males. Similarly, in the combined female sample but not in the males, there was a direct effect of emotional distress, which included anxiety, depression and hopelessness, on DSH. These results are important, because they suggest that in females, but not males, mild anxiety is a critical component of emotional distress, which in turn has a direct impact on reported engagement in self-harming behaviour. This is consistent with a number of studies, including four European-wide studies conducted by CASE, which showed anxiety to be a significant independent predictor of self-harm in female but not male adolescents (Camelot-Foundation, 2006; Eskin *et al.,* 2007; Hawton *et al.,* 2002)

Females showed greater levels than males of non-productive coping (i.e. strategies such as worry and avoidance), and of behavioural inhibition (BIS), which is

linked to avoidance behaviour. The path between emotional distress and self-harm was mediated fully by BIS and non-productive coping in females, and is therefore supportive of the Chapman *et al.* (2006) Experiential Avoidance Model (EAM), which postulates a link between self-harm and experiential avoidance of unwanted emotional experiences. Indeed, recent studies have shown emotional distress in female adolescents (i.e. anxiety and depression) to be specifically associated with self-harm driven by automatic reinforcement (i.e. to stop unwanted feelings/avoid emotion) (Hilt *et al.,* 2008; Nock & Prinstein, 2005). Moreover, rumination has been shown to moderate the relationship between emotional distress and self-harm driven by automatic reinforcement in adolescent females (Hilt *et al.,* 2008). This suggests that self-regulation deficits such as rumination and avoidance interact with emotional distress to predict self-harm behaviour in females.

While levels of sensation-seeking were equivalent in both sexes, sensation-seeking was positively correlated with self-harm in male school self-harmers but not females, suggesting a differential relationship in males and females between impulsivity and self-harm. Similarly, sensation-seeking was negatively associated with DSH thoughts in females overall but not males, suggesting that it exerted a protective effect on female self-harm behaviour. Moreover, in the merged male sample, there was a direct path between emotional distress, which included depression and hopelessness, and self-harm, which was fully mediated by the effects of impulsivity (BAS and sensation-seeking) and anxiety. This mediation was in turn significantly strengthened by maladaptive coping, which included BIS, non-productive coping and reference to others coping.

This relationship could reflect the role of impulsivity in increasing the preference for selection of maladaptive (and perhaps faster-acting) coping strategies, and therefore also DSH in male adolescents. A recent study showed that appropriate and inappropriate emotional regulation strategies mediated the link between impulsivity and depression in adolescents, therefore suggesting that impulsive adolescents, but not specifically males, may select less appropriate regulation

strategies, thus leading to depression (d'Acremont & Van der Linden, 2007). Alternatively, sensation-seeking in this context may better reflect externalising behaviour in males (e.g. high-risk behaviours such as use of drugs and alcohol), which is closely linked to anxiety and distress. In females however, this behaviour may be associated with reduced internalisation, hence protective against experiential avoidance and self-harm behaviour.

This final path model in males is not directly comparable to the EAM, because avoidance (BIS), is only indirectly related to DSH via impulsivity. This suggests that the conceptualisation of avoidance may differ for males and females and therefore further research into the differential relationships between psychological factors and DSH in males and females is required, in order to produce a model of affect regulation which more effectively reflects these interactions in both males and females.

The literature on the relationship between impulsivity and self-harm in males and females is somewhat inconclusive. Results from four CASE studies have shown impulsivity to be an independent predictor of DSH in adolescent females, but not males (Camelot-Foundation, 2006), although in adolescent psychiatric in-patients the reverse was shown to be true (Horesh *et al.,* 1999). Other findings suggest that 'rash, spontaneous' impulsivity or sensation-seeking is more prevalent in males, and may have a role to play in externalising behaviour (Langhinrichsen-Rohling *et al.,* 2004). Indeed, in this study, the stronger relationship between anxiety and impulsivity as opposed to anxiety and depression in males may reflect the close association between anxiety, impulsivity and externalisation in males (Marmorstein, 2007; Martin *et al.,* 1994). Similarly, the strengthening effect of maladaptive coping (i.e. reference to others coping, BIS and non-productive coping) on the path between DSH and impulsivity and anxiety, suggests that in males, pro-social behaviour, behavioural inhibition and non-productive coping may be related to sensation-seeking type behaviour (e.g. adolescent males who

self-harm may be more likely to engage in high-risk behaviours as part of a peer group).

The finding of correlations between parental bonding and self-harm in school but not college self-harmers, may be a cohort effect. Adolescents at school age are more likely to still be living at home with parents and are therefore more dependant than adolescents who have left the family home. In this way, reflections on parental bonding experiences would be more likely to relate to self-harm because these experiences would have been more currently relevant to school respondents. This suggests that retrospective measures of childhood parental bonding may be more relevant to young people who can reflect more objectively on childhood relationships with parents. Future research may achieve more fruitful results using, for example, the Adult Attachment Interview for Childhood and Adolescence or the Adult Attachment Interview (George *et al.*, 1986), with older adolescents who are more capable of objectively reflecting on attachment experiences.

In the female self-harming school sample, positive inter-correlations were noted between paternal overprotection and anxiety levels, and in the college sample, between maternal overprotection and BAS (which was conversely negatively correlated with emotional distress in this group). However, there was no evidence of inter-correlations between other factors and overprotection in males. This suggests that increased levels of parental control and protection in young adolescent females, but not males, is associated with increased levels of anxiety and decreased levels of goal-directed and approach based behaviour. This is supported by other studies, which have shown adolescent female self-harmers to be especially sensitive to family inter-personal relationship styles (Fotti *et al.*, 2006; Miller & Day, 2002). This is therefore a factor which should be considered in assessments with these groups and suggests a role for family therapy in helping to improve difficult familial relationship patterns.

Conversely, in the male school sample, paternal and maternal care were significantly negatively associated with emotional distress, suggesting that neglect and reduced levels of care and affection are associated with increased emotional distress in young adolescent males. Again, this may be a factor which requires closer enquiry during assessment of such groups, and could be modifiable through family therapy interventions.

6.2 Limitations of the study

6.2.1 Questionnaire Measures

This study used a dichotomous variable of deliberate self-harm and therefore included in one category individuals who had self-harmed only once or several times in the past year. This method was overly inclusive in order to maximise the numbers included in the path analysis, and has been used across most studies of deliberate self-harm. Moreover, there were no statistically significant associations between gender and frequency of self-harm methods used. Nonetheless, future research may benefit from differentiating between frequent and infrequent self-harmers, in order to identify psychological factors which may be uniquely associated with either of these groups. Indeed, more recent research has attempted to employ such methods (Gratz *et al.,* 2002).

A further limitation to our measure of self-harm was the probable ambiguity of the term self-harm. Participants were briefed on the nature of self-harm, and a brief definition was included in the information sheet. However, some students may not have endorsed engagement in self-harm because they felt their behaviour was not driven by distress (e.g. a number of online male students endorsed excessive alcohol intake sufficient to cause harm to the self, but then indicated that they had not self-harmed in the past year, and so were not included as self-harmers). A clearer and more inclusive definition of self-harm, which precedes the self-harm questions, may be more effective in capturing individuals who self-harm for a variety of other reasons.

Measures of emotional distress assessed the presence of symptoms of anxiety, depression and hopelessness experienced in the previous week, and therefore were limiting by giving no indication of levels of distress prior to, during, or directly following deliberate self-harm. Given the clinically non-significant levels of distress in our sample, a worthwhile future area of investigation may be state related distress and its relationship with the function of and engagement in self-harm.

The measure of coping (i.e. The Adolescent Coping Scale) was selected in order to capture a number of different 'self-regulation' strategies typically employed by adolescents to cope with distress. However, the results of the literature review have already highlighted the need for a unifying definition and operationalisation of affect regulation, given the increased understanding of its importance in the aetiology of DSH (Gratz, 2007). Future research would therefore benefit from the inclusion of a more specific measure of 'emotion-regulation' (e.g. Gratz & Roemer, 2004), but in particular, one adapted for adolescents (e.g. Phillips & Power, 2007).

This study was also limited by the omission of a measure of externalisation which may have been more relevant to a male model of self-harm behaviour. Other studies have suggested that a variable such as aggression may be a more recognisable expression of emotional distress for boys (Hilt *et al.,* 2008). Future studies would therefore benefit from the introduction of a measure of aggression alongside depression and anxiety, which may show a more robust association with self-harm in males than in females.

Failure to incorporate a measure of social desirability could also be considered a limitation to this study. It is therefore unclear how far adolescents, particularly those in schools and therefore in a less private setting, were socially motivated to respond positively to questions. Similarly, there was evidence of at least two pupils conferring with or copying one another, suggesting that peer pressure could

also impact upon questionnaire completion in such settings. This may therefore be an advantage to online questionnaire completion, where participants are likely to respond on home computers and therefore in private.

Finally, the online questionnaire format was not offered to schools because it was expected that not all pupils in all schools would have equal access to networked computers, unlike in further education institutions. Secondly, school pupils were also unlikely to have institution linked email addresses, making it difficult to distribute the link. Future studies may benefit from usage of an online webpage or forum which can be accessed via the internet, but with the proviso that all participating school pupils would be able to access computers for this purpose.

6.2.2 Sample issues

Response bias may have affected both study samples. Firstly, it is possible that the schools agreeing to participate in the study may have been motivated to do so because self-harm had previously been identified as a problem within their school. Secondly, given the reservations expressed by declining schools, the participating schools may have been unique in their commitment to increase awareness and encourage openness amongst their pupils Thirdly, given that only two schools eventually took part, the results cannot be generalised to a wider school population. Finally, participants opting into the online study in particular may have been uniquely motivated to do so (e.g. an interest in mental wellbeing issues) and therefore may not be representative of the population in general. Kraut *et al.* (2004) also noted that internet-based research samples may not be generalisable, because only certain groups have access to the internet (Kraut *et al.*, 2004). However, with respect to this study, our target population was a specific group of youngsters within further education, and therefore our internet sample had internal validity. Moreover, all research is subject to self-selection bias to some degree, such that participants may be motivated to participate in research for a number of possible unknown reasons.

An additional limitation is the larger proportion of female to male respondents. In both the school and the online sample, only 26 per cent of respondents were male. In the school study, this is likely attributable to one of the two schools being female only. However, in the online sample, students opting in were predominantly female, a pattern consistent with many other studies of self-harming behaviour in mid-adolescence (Brown *et al.,* 2007b; Gratz *et al.,* 2002; Langhinrichsen-Rohling *et al.,* 2004; Langhinrichsen-Rohling *et al.,* 1998; Mazza, 2000). As discussed previously, this may be the result of gender socialisation, and the greater willingness of females to share or seek help for their difficulties. A future challenge for such research would be to find methods of investigation which would make it easier for males to disclose mental-health difficulties.

Due to the smaller number of males in our samples, both were combined in order to maximise the total number of males and females in the path analysis. This was considered acceptable given that both samples were between 12 and 24 years old, (with overlap across samples) and therefore adolescents, and both were in higher education. One potential drawback to the combining of samples is that the slight differences in style of data collection (i.e. online versus paper questionnaire), may introduce heterogeneity. However, study information and questionnaire presentation were standardised as far as possible. The effects of reduced privacy in a classroom situation can only be controlled up to a point, and similarly, the expectation that online students completed questionnaires in private can only be assumed. Some differences were apparent in the correlational results (e.g. possible cohort effects for sensation seeking and parental bonding measures). For this reason, the parental bonding variables were not included in the path analysis. However, due to the known shared underlying factor structure for BAS and sensation seeking, the latter was retained in the analysis. Given the significance of the ensuing models, it is felt that this did not in any way compromise the analysis. Finally, due to the smaller number of males in the combined sample, the results of the path analysis and correlations should be interpreted with caution.

6.2.3 Analysis

Path analysis was appropriate for this study because it allowed for the testing of a hypothetical model based on the relationships between established psychological correlates of DSH. However, whilst path analysis can indicate the strength of respective paths within an a-priori model, it cannot establish the direction of the correlational relationships or the mutual dependence of variables upon one another, and it cannot account for any variables which have not been included within the model e.g. self-esteem. Similarly, where two equally valid but distinct models emerge, it cannot determine which is more appropriate. Therefore, conclusions drawn can only be based on the predicted model.

6.3 Clinical implications

6.3.1 Identifying and supporting adolescents who self-harm

Previous studies and reports have emphasised the importance of awareness raising amongst heath care professionals likely to come into contact with young people who self-harm (e.g. accident and emergency staff, general practitioners and psychologists), in order that the difficulties faced by young people and the possible aetiology of self-harming behaviour is better understood (Camelot-Foundation, 2006; Hawton *et al.,* 2006). However, in this study, the high prevalence rate of self-harm in the past year (41 per cent) and the sub-clinical levels of reported emotional distress, suggest that only a minority of adolescents who self-harm will actually come to the attention of health services. Moreover, as described in previous studies, young self-harmers often do not view themselves as needing support and rarely seek help for their behaviour (Evans *et al.,* 2005). Schools, communities and health services therefore have a very important role to play in identifying young people who are at risk, and enabling them to access appropriate support.

6.3.1.1 Gender and identification of young people with difficulties

Awareness of gender differences in self-harm behaviour, sources of distress and responses to issues around mental health generally, may improve the identification of young people with difficulties and the nature of support offered to them (Williams & Pow, 2007). The results suggest that impulsive or sensation seeking tendencies, especially when combined with coping through peer groups and anxiety, may further increase vulnerability to self-harm in males, possibly through the selection of faster acting but less adaptive forms of coping. As such, males who are reluctant or unable to explicitly report emotional distress may manifest difficulties in more external ways, such as drug taking and fighting. Our results also showed that the relationship between distress (in particular anxiety) and self-harm was completely mediated in females by avoidance and non-productive coping strategies, suggesting that internalising behaviour such as avoidance and rumination may make female emotional distress less visible, without the obvious physical evidence of self-harm.

Other evidence suggests that male adolescents are less likely than females to ask for the support of friends and family, and have less obvious gender-appropriate avenues of informal support (Camelot-Foundation, 2006; Evans *et al.,* 2005). Similarly, evidence suggests that despite male adolescents being more likely than females to believe they are in possession of sufficient mental health knowledge, to hold more negative attitudes towards mental health issues, and to have less knowledge about mental health issues, they are also more likely than females to request professional support for self-harm (Evans *et al.,* 2005; Williams & Pow, 2007). Williams and Pow (2007) also identified five significantly different sources of distress for male and female adolescents. Females were more likely than males to cite self-image, exams and home-life as sources of stress, while males were more likely than females to cite drugs and alcohol. These differences are in concordance with the gender differences in psychological factors associated with self-harm identified in chapter 2. Moreover, they highlight that the types of difficulties identified by males as distressing are often those used to cope with

distress, and may account for the high rate of externalising behaviours recorded in male adolescents.

6.3.1.2 Gender and support for young people who self-harm

Gender-appropriate means of support may include alternative means of externalisation for males, such as sport and drama, which may encourage an expression of difficulties in more adaptive ways. However, interestingly, a recent report suggested that competitive extra-curricular activities, such as sport, reduced juvenile delinquent behaviour in females but not in males, whereas more non-competitive group pursuits such as attending church and involvement in the community had a protective effect in males but not in females (Booth *et al.,* 2008). Superficially, this suggests that non-gender stereotypical activities may reduce high-risk behaviours in males and females. However, more research of this type is required in order to replicate and elaborate upon these findings.

Female adolescents in particular are more likely to approach friends and family for emotional support, and have reported a need for informal drop-in-type support services within schools to make such help more accessible (Camelot-Foundation, 2006; Hawton *et al.,* 2006). However, the reliance on peers for support represents a double edged sword. A recent study investigated the use of internet based sites as a means of peer support for self-harmers, and reported more than four hundred self-harm related message-boards populated predominantly by female self-harmers between the ages 12 and 20 years old. Whilst these boards effectively reduced social isolation and normalised self-harming behaviour, they were also a means of encouraging DSH, and assisting in adding to the repertoire of self-harm behaviours (Whitlock *et al.,* 2006b). There is therefore a need for providing a space for youngsters to share experiences, but in a safe and informed way (e.g. particularly if run by charitable or voluntary services, examples being Penumbra (Scotland) and Young-Minds (UK)). Moreover, given the reluctance of males to seek help directly, non face-to-face supports such as web-forums may be less threatening vehicles in which to access knowledge and support about self-harm.

Evidence suggests that peer support approaches in schools (e.g. one-one confidential listening and buddies) are not an alternative to psychological intervention, but may be an effective way of reducing social isolation, equipping students with the means to support one another effectively, and encouraging youngsters to seek professional help (Camelot-Foundation, 2006; Childline, 2005). A number of voluntary organisations have devised and implemented such approaches in secondary schools throughout the UK (e.g. Childline in Partnership with Schools (CHIPS), and The Mental Health Foundation).

6.3.2 Psycho-education in schools

Some schools declined participation in this study due to concerns over the sensitivity of the subject matter. These concerns included fear of inciting vulnerable children to self-harm, exacerbating current problems with self-harm by further raising awareness, or precipitating an 'outbreak' of 'infectious' self-harming behaviour in the classroom. Moreover, one local authority declined participation due to the perceived inability of current mental health services to meet the increased demand which may ensue as a result of such research. These objections raise several important issues regarding self-harm awareness in schools. Firstly, that both schools and local authorities are in agreement that self-harming behaviour is a relevant and concerning issue within schools. Secondly, that raising awareness about self-harm is not considered beneficial without services and schools feeling equipped to manage these cases, and finally, that refusal to participate was in some instances motivated by both fear of and misinformation about self-harm in adolescents.

A survey conducted within schools to investigate teachers' views on and experiences of self-harm behaviour revealed self-harm knowledge to be limited and reactions to include shock and panic (Best, 2006). Best (2006) recommends increasing teachers' knowledge, without increasing 'institutional' panic, as has been seen in previous awareness raising initiatives (e.g. publicised child sexual abuse cases in the 1980s). Best (2006) also suggests that emphasising the pastoral role of teachers in schools may be unrealistic. Instead, he recommends improving

understanding of risk factors for deliberate self-harm in young people, and thereby encouraging the building of skills and enhancing of protective factors to counteract these (e.g. confidence and self-esteem building, self-regulation training, problem solving coaching, strategies to reduce school bullying) (Best, 2006).

In an early study, Klingham and Hochdorf (1993) employed a Skills Training Program designed to enhance secondary school-based adolescents' ability to manage their own distress and recognise distress in others. Evaluations showed a reduction in males' intention to commit suicide and increased awareness of alternative strategies for coping (Klingham & Hochdorf (1993) as cited in Hawton *et al.,* 2006). Similarly, in the UK, the Samaritans have very recently devised an emotional support program for 14-16 year olds in schools (Developing Emotional Awareness and Learning), which can be incorporated into the school curriculum via the Personal and Social Education (PSE) classes, or other subjects such as English, Geography and Drama, and is designed to enhance awareness of emotional difficulties and coping strategies for common areas of distress (Camelot-Foundation, 2006; Samaritans, 2005). Importantly, evidence suggests that whole-school approaches to raising awareness about emotional and mental health issues generally are most effective in encouraging help-seeking for and changing attitudes towards a range of difficulties, including bullying and depression (Camelot-Foundation, 2006).

6.3.2.1 Psychological interventions for DSH

Clinical Psychology has an important role to play, not only in supporting voluntary services and schools in knowledge sharing and training for skills building in young people, but also in providing effective, evidence-based interventions for DSH. Where young people who self-harm have been identified, there is often a need for psychological interventions which address the core difficulties maintaining self-harming behaviour (e.g. through cognitive

restructuring, breaking habitual patterns, improving problem-solving ability and enhancing emotion regulation).

Reviews of the literature suggest that the evidence for the effectiveness of interventions used in the treatment of people who self-harm (i.e. by reducing repetition) is limited, although dialectical behaviour therapy emerged as superior to standard after-care treatment (Hawton *et al.,* 1998), and family therapy showed some promise in reducing suicidal ideation (Burns *et al.*, 2005). Indeed, systemic family therapy is recommended as the first choice evidence-based treatment for self-harm in young people (Wolpert *et al.,* 2007). Cognitive-behavioural approaches to the treatment of DSH identify distorted cognitions as integral to the maintenance of DSH. Recent adaptations to this approach, such as acceptance and commitment therapy and mindfulness, attempt to make clients aware of the effects of cognitions upon their emotions and behaviour, encourage attendance to and interpretation of these changes and therefore aim for a reduction in avoidance of unwanted emotional experiences (Slee *et al.,* 2008a). Recent evidence showed that a cognitive-behavioural approach relative to treatment as usual over a period of 9-months in adolescents and adults who self-harmed, resulted in significant reductions in self-harm, anxiety and depression and improvements in problem-solving ability and levels of self-esteem (Slee *et al.,* 2008b). The literature highlights the need for better experimental and randomised-control trials of psychological interventions for self-harm, in order to facilitate the identification of the most appropriate and effective evidence-based treatments.

6.4 Final conclusions

In conclusion, our results have shown gender differences in the relationships between emotional distress, personality, coping and self-harm. Whilst these results are limited by a number of factors, including small sample size, thus making it difficult to generalise to a larger population, it is hoped that this study will act as a pilot project to a future larger investigation in this area. More

importantly, it is further hoped that these results will make some contribution to the adoption of more gender specific intervention and prevention strategies for deliberate self-harm in adolescence.

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Appendix A: Systematic Review Tables 1 & 2

Table 1: Table of studies included in systematic review

Table 1: Studies included in systematic review

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
(Allison et al., 1995)	Schools Australia N=307 156M: 151F	13-17 years	1) IRQ 2) PBI 3) BHS	Chi-square (inc genders comparison) T-Tests Correlations	30% DSH 9% Attempts F=M	DSH mixed intent (Pearce & Martin, 1994) ASQ
(Bergen et al., 2003)	Schools Australia N=2603 1442M: 1154F	Time 1- 14yrs Time 2- 15yrs Time 3- 16yrs	1) YAC 2) CES-D 3) BHS 4) CSA questions	Logistic regression (M & F analysed separately)	18% F:15% M DSH 3.9%M: 6.6%F Attempts NS	DSH mixed intent (Pearce & Martin, 1994) ASQ
(Bjarehed & Lundh, 2008)	Schools Sweden Time 1 N=175 85M:90F Time 2 (2 months later) N=184 90M:94F	AVG= 14 yrs	1) SDQ 2) Risk Behaviours for Eating Disorder 3) Body Esteem Scale 4) ERQA 5) ETI	Correlations (separately for M and F) Regression	40.2% DSH (1) 36.5% DSH (2) F=M	Non-Suicidal DSH DSHI (Gratz, 2001)
(Borowsky et al., 2001)	Schools USA Time 1 N=90118 Time 2 (1yr later) N=13110	Time 1-12 yrs Time 2-14 yrs	Home interviews	Logistic regression (separately for M and F)	3.6% attempts 5.1% F:2%M Attempts Sig	Suicidal DSH Attempted suicide question
(Brunner et al., 2007)	Schools Germany N=5759	AVG=14yrs	1) YSR 2) K-SADS 3) CBCL	Multivariate multinomial logistic regression	18.9% all types DSH; 10.9% DSH	Non-Suicidal DSH

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
	49.8% F: 50.2%M			Response variable=DSH (none, occasional and repetitive) Explanatory variable=sex	occasional; 63% F: 36% M Sig. 4% DSH repetitive; 74% F : 26% M Sig. 47%F :53% M no DSH	K-SADS
(Cheng & Chan, 2007)	Schools China N=1083 No ns given	Not given	1) Death attitude 2) Depression 3) Stress 4) Substance Use 5) Social Support	Structural Equation Modelling (gender & age endogenous factors)	9.5%F: 6.6%M attempts NS	Suicidal DSH Plans and Attempted Suicide Questions
(De Leo & Heller, 2004)	Schools Australia N=3757 48% F: 52%M	14-18yrs	1) HADS 2) PIS	Chi-square (gender) Multiple logistic regression Multivariate analysis for F only	12.4% lifetime prevalence 11%F:1.6%M Sig.	DSH mixed intent (CASE, 2000)
(Eskin et al., 2007)	Schools Turkey N=805 367 F: 438 M	AVG= 14.8yrs	1) Religiosity 2) Assertive Problem solving 3) Social Support 4) Depression 5) RSES	Stepwise logistic regression (suicidal behaviour X sex)	2.4% attempts 1.7%M:3%F NS	Suicidal DSH Ideation & Attempted Suicide Questions
(Evans et al., 2005)	Schools UK N=6020 3186M:2810F: 24DK	15-16 yrs	1) 8 Coping strategies 2) Communication. 3) Help seeking	Chi-square Kruskal-Wallis (gender comparison)	6.9% DSH 3.2%M:11%F Sig	DSH mixed intent (CASE, 2000)

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
(Fleming et al., 2007)	Schools New Zealand N=9570	9-13 yrs	Computer assisted interviewing 1) Depression 2) Alcohol 3) Family 4) Friendship 5) Religion	Multivariate analyses	4.7%M:10.5%F Attempts Sig	Suicidal DSH Attempted Suicide
(Flouri & Buchanan, 2002)	Schools UK N=2722 1124M:1402F	14-18yrs	1) Family structure 2) Socio-economics 3) Parental Involvement 4) Role models 5) Academic 6) Motivations 7) Confidence 8) Family conflict 9) Peers	Hierarchical logistic regression (Model1 - age, gender and demog + suicide attempts only)	11.4% Attempts NS	Suicidal DSH Attempted suicide Question
(Garrison et al., 1993a)	Schools USA N=444 + Parents. 56%F: 44%M	12-14 yrs	Screened with CEDS first. 1) CES-D 2) YRBS 3) FACS 4) CLES 5) K-SADS at interview phase 6) K-SADS IMPULSIVITY-'*acting before considering ones actions*'.	Logistic regression (Adjusted for age and sex in first model. Then included sex in multivariable model with those variables of initial significance)	2.5% 2.5% M:2.9%F NS	Non-Suicidal DSH K-SADS
(Garrison et al., 1993b)	Schools USA N=3764 55%F:45%M	14-18 yrs	1) YRBS	Logistic regression (Adjusted for age and sex in first model. Then included sex in multivariable model	5.9% attempts F>M Sig	Suicidal DSH Attempted Suicide Question

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
				with those variables of initial significance)		
(Hawton et al., 2002)	Schools UK N=6020 3186M:2810F: 24DK	15-16 yrs	1) Depression & Anxiety. 2) PIS 3) RSES	Chi-Square T-Tests Logistic regression (separate for M and F)	6.9% DSH 3.2%M:11.2% Sig	DSH mixed intent (CASE, 2000)
(Izutsu et al., 2006)	Schools Japan. N=486. 239M: 238F	AVG= 14.16yrs	1) Substance use questions. 2) Wender-Utah Rating Scale for Hyperactivity.	Chi-square T-test Correlations	24.5% DSH M>F Self-hit	DSH mixed intent
(Juon et al., 1994)	Schools Korea N=258970 Junior (8^{th}) N=270636 Senior (11^{th}) 50.7%M:49.3%F	AVG= 14.95yrs	(1) Substance Use (2) Distress- Depression & Hostility (3) Social integration-religion, parental status	Logistic regression (Adjusted for age and sex in first model. Then included sex in multivariable model with those variables of initial significance)	4.4% attempts F>M (13yrs) F=M (15yrs)	Suicidal DSH Ideation & Attempted Suicide Questions
(Langhinrichsen-Rohling et al., 1998)	Schools USA. N=206. 48.1% M: 51.9%F	AVG= 16.3yrs.	1) LAS 2) Depression Scale (Radloff 1977). 3) BDI 4) BHS 5) CMSDS	ANOVAs Correlations (separately for genders)	M>F suicide proneness	DSH mixed intent LAS
(Laye-Gindhu & Schonert-Reichl, 2005)	Schools Canada. N=424. 55.7% F	13-18 yrs AVG= 15.3 yrs.	1) (RAAS) 2) Anger & Discomfort Scale. 3) CMSDS	Chi-square MANOVA (gender X DSH)	15% DSH 8.5%M:20.3%F Sig	Non Suicidal DSH Incidence & Motivations for DSH Questionnaire
(Lewinsohn et al., 2001)	Longitudinal 3 stage study	14-18yrs 19-23yrs	1) Negative cognitions 2) Attribution style	Logistic regression to detect gender effect	At 12-18yrs Attempts (life)-	Non-Suicidal DSH

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
	Schools USA Time 1 N=1709 Time 2 N=1507	24yrs	3) Self-esteem (general and physical) 4) Emotional reliance 5) Self-consciousness 6) Social self-competence 7) Coping skills 8) Friend & family support 9) HOPELESSNESS 10) Events 11) Psychopathology		12.8%F:6%M Sig	K-SADS
(Liu et al., 2005) (Liu & Tein, 2005)	Schools China N=1362 40% F:60%M	AVG= 14.6yrs	1) YSR Depression 2) YSR Aggression 3) ASLEC 4) Nowicki Strickland Locus of Control 5) Child & family variables	Chi-squares (inc gender) (3 grps-ideation, attempt & non suicidal) Logistic regression (inc gender)	10.5% Attempts (past 6 months) 2.3%-12yrs 11.5%- 18yrs 7%F:7%M NS	DSH mixed intent YSR & CBCL
(Lloyd-Richardson et al., 2007)	Schools USA. N=633 57%F:43%M	AVG= 15.5 yrs	1) SIQ	Chi-square T-tests (grps of minor, mod & severe NSSI on all factors inc gender)	46.5% DSH F=M	Non-Suicidal DSH FASM (Lloyd-Richardson et al., 1997)
(Lundh et al., 2007)	Schools Sweden. N=128.	AVG= 15yrs	1) RSES 2) Mindful Attention Awareness	Chi-Square (inc gender) ANOVAs T-tests	65.9% DSH once 61.7%F: 68.4%M NS	Non-Suicidal DSH (Gratz, 2001) DSHI
(Martin & Waite,	Schools	AVG=	1) PBI	Chi-squares	15% DSH	DSH mixed intent

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
1994)	Australia N=681 56%M:44%F	15 yrs	2) YSR	(inc gender) T-test (separately for genders) Stepwise regression	14.9%M:15.4%F NS	 (Pearce & Martin, 1994) ASQ
(Martin et al., 1995)	Schools Australia. N= 352 201M:151F	14-16 yrs	1) Life events Questionnaire 2) BDI 3) BHS 4) FAD	Univariate analysis (inc gender) & stepwise regression	8.9% DSH 9%F:8%M NS	DSH mixed intent (Pearce & Martin, 1994) ASQ
(Martin et al., 2004)	Schools Australia N=2485 55.5%M:44.5%F	AVG= 14 yrs	1) Questions CSA and associated distress. 2) BDI 3) BHS 4) FAD N.B: risk taking and delinquency not included.	Chi Square (inc gender) Logistic regression	18.4% DSH 17.5%M:19.3%F NS 4.5%M:7.3%F Attempts Sig 55%CSA_M: 29%CSA_F Attempt Sig	DSH mixed intent (Attempts and DSH separated) (Pearce & Martin, 1994) ASQ
(Mazza, 2000)	Schools USA N=106 54F: 52M	AVG= 15.63yrs	1) APS PTSD and Depression	Regression		Suicidal DSH SIQ
(Mazza & Reynolds, 2001)	Schools USA N=456 60.7% F	Avg= 14.5yrs	1) APS	ANOVAs & MANOVA (separately for genders)	20% attempted F>M Sig	Suicidal DSH SIQ & Suicide Attempt Question
(McKeown et al., 1998)	Schools USA N=444	12-14 yrs	Screened with CEDS first 1) CEDS	Regression (sex inc as predictor)	1.3% attempters	Non-Suicidal DSH

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
	& Parents. 56% F:44%M		2) YRBS (3) FACS (4) CLES (5) K-SADS interview (6) K-SADS IMPULSIVITY			K-SADS
(Morey et al., 2008)	Schools Ireland N=3880 50.2% F: 48.8%M	15-17 yrs	Child and Adolescent Self Harm in Europe (CASE) Survey	Relative risk for prevalence rates in grps (inc gender)	9.1% DSH F>M Sig	DSH mixed intent (CASE, 2000)
(Muchlenkamp & Gutierrez, 2004)	Schools USA. N=390 176M:214F 54.9% F	AVG=16.3yrs	1) RADS 2) SIQ 3) Multi-Attitudes Suicide Tendency Scale.	Chi-square (inc gender) ANOVA Linear regression.	15.9% DSH 5.6% Attempts No gender diffs in DSH grp, but F>M Attempts	Non-Suicidal DSH (Attempts & DSH separated) (Gutierrez et al., 2001) SHBQ
(Muehlenkamp & Gutierrez, 2007)	Schools USA N=540 62.3% F: 37.7%M	AVG=15.53yrs	1) RADS 2) SIQ 3) RFLI	ANCOVAs (gender & time since last DSH as covariates)	23.2% DSH No gender diffs in attempts alone or DSH alone, but F>M Attempts + DSH (non suicidal)	Non-Suicidal DSH (Attempts & DSH separated) (Gutierrez et al., 2001) SHBQ
(O'Donnell et al., 2004)	Schools USA N=879 42.1%:57.9% At 12yrs and 16yrs	12-16 yrs	1) RADS 2) John Henry Coping Scale 3) Sociodemg	Logistic regression	5.1%F:3.2%M Multiple attempts NS 13%:7.3%M One	Suicidal DSH Ideation & Suicide Attempt Questions

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
					attempt Sig	
(Patton et al., 2007)	Schools USA &Australia N=3332 1630M:1702F	12-15yrs (puberty) AVG= 14yrs	1) CTC Youth Survey 2) MFQ 3) Monitoring Future Surveys-Substance use	Multivariate logistic regression (gender as predictor)	3.7% DSH definite 2.2%M:5%F Sig 5% probable DSH 3.6%M:6.3%.F Sig	DSH mixed intent Modified BSI
(Patton et al., 1997)	Schools Australia N=1699. 52.3%F	AVG= 15.9yrs	1) Psychiatric Interview 2) Anti-Social Behaviours Scale (Moffitt & Silva) 3) Drug Use & Sexual activity	Regression (gender inc as predictor)	5.1% DSH 6.4%F: 4%M Sig	DSH mixed intent Modified BSI
(Ponnet et al., 2005)	Schools Belgium. N=2707 43% F	AVG= 14.7yrs	1) Social & Health Assessment 2) CASE 3) Parenting Scale	ANCOVA Logistic regression (separate for genders)	23.9%F:12.7&M DSH Sig	DSH mixed intent (CASE, 2000)
(Richardson et al., 2005)	Schools Australia N=2596 44.5% F	AVG=13yrs	1) Perceived Academic Performance 2) RSES 3) Nowicki-Strickland Locus of Control 4) CES-D	Logistic regression (gender entered as predictor)	16% DSH 17.5%F :14.8% M DSH NS 6.4%:3.7% Attempts Sig	DSH mixed intent (Attempts and DSH separated) (Pearce & Martin, 1994) ASQ
(Ross & Heath, 2002)	Schools Canada. N=440 219M: 221F	AVG=15yrs	1) BDI 2) BAI 3) Coping Questionnaire.	MANOVA (gender X DSH/nonDSH)	20.45% screening 13.9% at interview 64%F:36%M Sig	DSH mixed intent
(Tousignant et al.,	Schools	14-17yrs	1) PBI	Hierarchical logistic	17.3% F: 8.7% M	Suicidal DSH

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
1993)	France N=2327 Telephone survey (>18)	18-24 yrs	2) Parental marital status	regression (inc gender)	attempts (school) Sig 13.4%F:14.7%M (18-24yrs) NS	Attempted Suicide Question
(Thompson et al., 2005)	Schools Mexico N=1287 690M: 597F	AVG=16yrs	1) High School Questionnaire- risk factors 2) Anxiety 3) CES-D 4) HOPELESSNESS 5) School performance 6) Family Support	T tests Structural equation modelling (separate for gender)	10.8% attempters F>M Attempts Sig	Suicidal DSH Attempted Suicide Question
(Walsh & Eggert, 2007)	Schools Australia N=730 56%M	AVG= 15.93yrs	1) High School Questionnaire-coping, family support, drugs	ANCOVA (between genders)	17% attempters F>M Sig	Suicidal DSH MAPS
(Wichstrom, 2000; Wichstrom & Rossow, 2002)	Longitudinal study Schools Norway Time 1 N=12287 Time 2 (2yrs later), N=9679	12-20yrs	1) DMI 2) Disordered Eating 3) Sex-Role ID 4) Perceived Pubertal Timing 5) Body Satisfaction 6) Romantic relationships 7) Conduct problems 8) RSES 9) Loneliness 10) PBI 11) Parental Monitoring	T-tests (between gender) & Multivariate logistic regression (inc gender step 1)	Time 1- 8.2% attempters 10.4%F: 6% Attempt Sig	Suicidal DSH Attempted Suicide Question
(Wild et al., 2004)	Schools S. Africa 2 classes	AVG= 14.1 yrs AVG= 17.3 yrs	1) BDI 2) Self-esteem Questionnaire (Du Bois)	Descriptive (inc gender) Regression	13%F : 9%M Attempts (14 yrs)	Suicidal DSH Ideation and

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
	N=939			(adjusted for gender)	14%F: 7%M Attempts (17 yrs)	Attempted Suicide Questions
(Wong et al., 2007)	Schools Hong Kong. N=1361	AVG= 14yrs	1) State-Trait Anxiety Scale. 2) Depression Scale (Radloff 1977) 3) BSI 4) Life Stress Inventory 5) Family relationships 6) Suicidal ideation	Chi-Square Anova Multiple logistic regression	10.9% DSH 17.7%F:7.3%M Sig	DSH mixed intent Modified BSI
(Yates et al., 2008)	Schools USA N=1,036 (west coast cross section) N=245 (east coast longitudinal) 538F:498M	14-17yrs 11-17yrs	1) Parental criticism 2) Parental alienation 3) Delinquent Behaviour	Poisson regression	8.8%F:7.5%M X 1 non suicidal DSH Sig 30.5%F: 22.8%M >1 non suicidal DSH Sig	Non-Suicidal DSH FASM (Lloyd-Richardson et al., 1997)
(Yip, 2005)	Schools Hong Kong N=2586 1058M: 1528F	AVG= 15.8yrs	1) CES-D 2) Family 3) Social suppt 4) Substance 5) Youth Sex Survey	Multivariate and logistic regression Suicidality a continuous measure across 5 progressive levels	8.4% attempters 8.3%F:8.5%M Attempts NS	Suicidal DSH Ideation and Suicide Attempt Questions
(Zoroglu et al., 2003)	Schools Turkey N=839 61.1%F	AVG= 15.9yrs	1) Childhood Abuse & Neglect Questionnaire 2) DES	T-tests (by gender) Logistic regression.	10% attempters 21.4% DSH 21.5%F:21.3%M NS	Non Suicidal DSH Suicide Attempt & Self-Mutilation Questionnaire
(Andover et al., 2007)	College, USA	AVG=18yrs	1) SCL-90	ANOVAS	N/A	Non-Suicidal

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
	N=510 44 DSH (59% F) & 44 C (56% F)		2) Coping strategy indicator 3) Freq Activities Scale	(inc gender analysis between DSH vs. non-DSH)		DSH (Andover & Pepper, 2002) SMBI
(Brown et al., 2007)	College, USA. N=223 76.2%F:23.8%M	AVG=19.4yrs	(1) SBQ (2) PANAS (3) Coping Strategies (Carver 1989).	ANOVAs (inc gender)	17.5% DSH past year. 27.8% overall DSH F=M	Non-Suicidal DSH DSHI(Gratz, 2001)
(Edwards & Holden, 2001)	College, Canada N=298 UGs 151F: 147M	AVG=19.27yrs	1) Coping Inventory for Stressful Situation 2) Sense of Coherence Scale 3) Purpose in Life Test 4) BHI	Multiple regression (ender as predictor)	4%M: 11%F attempts previously Sig	Suicidal DSH MMPI
(Ellis & Lamis, 2007)	College, USA N=344 UGs	AVG=19yrs	1) RFLI	Chi-square (inc gender) ANOVA (gender grp)	F=M	DSH mixed intent Suicide Behaviours Questionnaire
(Eisenberg et al., 2007)	Web Survey College USA N=2843 61.2% F	18-30yrs	1) Depression 2) Anxiety 3) Demographics	Logistic regression (inc gender as predictor)	Only 1 student reported suicide attempt in past 4 weeks	Suicidal DSH Ideation, Plans & Suicide Attempt Questions
(Gratz et al., 2002)	College, USA N=133 67% F	AVG=22.7yrs	1) PBI 2) PAQ 3) DES 4) CMSDS 5) Attachment Disruption Questionnaire	Correlation Regression (Separate analyses for M and F)	38% DSH F=M	Non-Suicidal DSH DSHI (Gratz, 2001)

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
			6) Abuse & Perpetration Inventory			
(Langhinrichsen-Rohling et al., 1998)	College, USA. N=593 51.3% F	AVG= 19.6yrs	1) LAS 2) Depression Scale (Radloff 1977). 3) BDI 4) BHS 5) CMSDS	MANOVA (inc gender)	M>F risky behaviour	DSH mixed intent LAS (Lewinsohn 1995)
(Langhinrichsen-Rohling et al., 2004)	College, USA N=383 30.1%M	AVG=20.42yrs	(1) CES-D (2) Hostility Scale (3) Hopelessness (Kazdin) (4) Impulsivity-Eysenck's Scale (5) Delinquency Scale	ANOVAs Correlation (inc gender)	9% attempted at least once	DSH mixed intent LAS
(Miller & Day, 2002)	College, USA N=421 54% F	AVG =19.5yrs	1) Family Communication Patterns Instrument 2) Perfectionism Scales 3) Family Emotional Closeness Scale	Logistic regression (No analysis of males due to too few attempters)	F>M (x4)	Suicidal DSH Ideation & Suicide Attempts Questions
(Wang et al., 2003)	Cross-sectional College, Nova Scotia,		1) Depression 2) Help Seeking 3) Self-esteem		F=M	Suicidal DSH
(Whitlock et al., 2006; Whitlock & Knox, 2007)	Web Survey College, USA. N=2875 56.3% F	18-24yrs (73% of sample) >25 years (27%)	1) Suicidal behaviours 2) Abuse 3) Psychological distress 4) Mental health indicators 5) Risk (eating disorder, abuse, distress) 6) Protective (attraction to life and help seeking)	Regression (inc gender) SIB Suicide SIB & Suicide Neither	6%F:3.9% SIB only F>M suicide attempts Sig 4.9%F-both: 1.8%M-both Sig	Non-Suicidal DSH Whitlock Internet Survey (2006)

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
			7) Assessment of suicidal behaviours			
(Brezo et al., 2007)	Longitudinal prospective population based school cohort Canada N=3017-1715	6 -20yrs	(1) Personality (2) BIQ Barrat Impulsiveness Questionaire (3) Physical Abuse (4) Stressful Life Events (4) Social Support Scale	Univariate (inc gender)- pre-selected for the Multivariate analyses Regression (gender predictor)	2% adolescents multiple attempts F X4 >M for attempts F X5 >M multiple attempts Sig	DSH mixed intent Modified BSI
(Bronisch et al., 2005)	Longitudinal prospective study Germany N=3021 Time1-Time 2 (20 months later)	14-17yrs	1) Munich Composite International Diagnostic Interview (M-CDI) Affective Disorder Section- mania and hypomania 2) M-CDI Depression	Regression (adjusted for gender and age)	2.3% attempters 3.1%F:1.5%M Sig	Suicidal DSH Ideation & Attempted Suicide Questions
(Buddeberg et al., 1996)	Cross sectional longitudinal study Sweden Time 1-N=1937 Time 2- N=475	14-19yrs	(1) Eating Attitudes Test (EAT) (2) Self Report Symptom Checklist	Correlations (inc gender) ANOVAs	Only 1% F and 0.6% M suicide attempt within 18 month follow up period.	Suicidal DSH Ideation & Attempted Suicide Questions
Fotti 2006	Cross sectional Canada N=1049F:1041M	12-13yrs	(1) Peer relationships (Marsh Self-Description) (2) Parental nurturance & rejection	Logistic regression	5.9%F:2.4%M Attempts Sig	Suicidal DSH NLSCY
(Gould et al., 1998)	Population based, USA N=1285 604F:681M	7-18yrs	1) NIMH Psychiatric Diagnosis	Chi-Square Logistic Regression (Adjusted for sex & Separate gender analysis)	3.3% Attempts 2.2%F:1%M Sig	Suicidal DSH NIMH Diagnostic Schedule
Kisch 2005	National College Health Assessment	18-24yrs	1) Health 2) Mental Health	T-tests (inc gender)	1.5% attempters 1.1%F:0.8%M	Suicidal DSH

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
	USA N=15977 61.8%F		3) Drugs 4) Sex 5) Academics 6) Demographics	Regression (inc gender predictor)	1>Attempts NS	NCHAS
(Klonsky et al., 2003)	Population based Military Cohort , USA N=1986 38%F:62%M	AVG= 20yrs	(1) Schedule for Non-Adaptive Personality (SNAP) (2) Peer Inventory of Personality Disorders (3) Beck Depression Inventory (4) Beck Anxiety Inventory	T-tests (inc gender)	4% DSH At least once 'Hurt self on purpose' 2.5% M: 1.7%F NS	Non-Suicidal DSH SNAP
(Mitchell & Ybarra, 2007)	Telephone Survey Internet Users, USA. N=1500 81%DSH Grp- F	10-17yrs AVG=14 yrs	2nd Youth Internet Safety Survey. (1) YSR of CBCL	Chi-Square (inc gender) Regression (Adjusted for gender)	3% (N=37) DSH in past 6 months (of this group 81%F) F>M	DSH mixed intent YSR of CBCL
(Nixon et al., 2008)	Cross sectional Phone Interview British Columbia N=568 N=263 M:305 F 77% (N=74) of DSH grp (N=96) F	14-21yrs	(1) Anxiety (2) Depression (3) Separation from parents (4) Impulsivity (5) Cooperation (6) Conduct	T-tests Chi-square Logistic regression (variables that diff between DSH and non DSH entered as predictors e.g. sex and age)	16.9% DSH 3.8%M:13%F Sig	Non suicidal DSH Modified (CASE, 2000)
(Reinherz et al., 1995)	Longitudinal study, USA Time 1- N=404 Time 2- N=385 195M:190F	15yrs 17yrs	1) Self-concept scale 2) Child Behaviour Checklist 3) Academic ability 4) Youth Self Report Scale	Chi-square (inc gender) ANOVA (inc gender)	4.2% attempters at 18 5.8%F:2.6%M (aged 18) Sig	Suicidal DSH Ideation and Attempted Suicide Questions
(Rodriguez et al., 2006)	Nicaragua N=352 145M; 133F	15-24yrs	1) Attitudes towards Suicide Questionnaire	Correlations (inc gender)	1.5%F: 2.1%M attempters NS	Suicidal DSH Plans and Suicide

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
						Attempts Questions
(Rossow & Wichstrom, 1994)	National sample Norway N=12000 5093M:5234F	12-17yrs	1) Intoxicants survey 2) Depression (Kandel & Davies 1983) 3) Loneliness (Russell, 1980)	Logistic regression	8.3% Attempts 6%M: 10.5%F (13-16yrs) Sig Also F>M attempts in 12-20 yrs	Suicidal DSH Attempted Suicide Question
(Sourander et al., 2006)	Longitudinal follow-up birth cohort study Finland	3yrs 12yrs 15yrs.	1) CBCL 2) YSR 3) FAD	Repeted measures for effects of sex and age on DSH reports at 12 and 15yrs Logistic regression (inc gender predictor)	Age 12- 2.7%F: 3.1% M DSH NS Age 15- 12.6%F:4.6%M DSH Sig	Suicidal DSH Ideation and Attempted Suicide (Inc in DSH group if reporting either acts OR ideations)
(Waldrop et al., 2007)	Household probability sample, USA Parent interviewed first N=4023 2002M:1904F	12-17yrs	1) Alcohol/drug abuse in family 2) Violence exposure 3) PTSD 4) Depression	Logistic regression (demographics entered on first step; others categorised by type and entered as steps 2 and 3 e.g. family or psychopathology)	3.3% attempters	Suicidal DSH Ideation and Suicide Attempts Questions
(Windle & Windle, 1997)	Four wave panel design, USA N=975		1) Depression 2) Substance Use	Regression		Suicidal DSH
(Wunderlich et al., 2001)	Population based, Germany N=3021 70 Attempters 22M:48F	14-24yrs	Composite International Diagnostic Interview -trauma, diagnoses and suicidality	Logistic regression (separate for gender)	5.2% total sample attempters 7.2%F:1.7%M Attempts (14-17yrs) Sig 6.2%F:4.3%M Attempts	Suicidal DSH Ideation & Suicide Attempts Question

Study Authors	Sample	Age	Measures	Statistics	DSH prevalence	DSH measure
					(18-21yrs) NS 5.7%F:4.5%M Attempts (22-24yrs)NS	
(Young et al., 2007)	Prospective population based survey, West Scotland. N=1258	18-20yrs	(1) Parental social class (2) Education/job	Chi-square Fishers exact test T-tests (by gender)	7.1% lifetime DSH F=M	DSH mixed intent

APS- Adolescent Psychopathology Scale, API- Abuse & Perpetration Inventory ASLEC- Adolescent Self-Rating Life Events Checklist, ARS- Affect Regulation Scale, ASQ1-Attachment Style Questionnaire, ASQ- Adolescent Suicide Questionnaire

BAI- Beck's Anxiety Inventory, BDI- Beck's Depression Inventory, BHS- Beck's Hopelessness Scale, BPD- Bipolar Disorder or Borderline Personality Disorder, BIQ- Barratt Impulsiveness Questionnaire, BSI- Beck Suicide Inventory

CASE- Child & Adolescent Self-Harm in Europe, CBCL- Child Behaviour Checklist, CDI- Children's Depression Inventory, CES-D- Centre for Epidemiological Studies Depression Report, CIDI- Composite International Diagnostic Interview, CSA- Child Sexual Abuse, CLES- Codington Life Events Schedule, CMCDS- Crowne-Marlowe Social Desirability Scale, CRSQ- Children's Response Style Questionnaire, CTC- Community That Cares Youth Survey, CTQ- Child Trauma Questionnaire

DES- Dissociative Experiences Scale, DMI- Depressive Mood Inventory, DSH- Deliberate Self-Harm, DSHI- Deliberate Self-Harm Inventory

ERQA- Emotion Regulation Questionnaire for Adolescents, ETI- Emotional Tone Index

FACS- Family Adaptability Cohesion Scales, FASM- Functional Assessment of Mutilation

HADS- Hospital Anxiety & Depression Scale

IRQ- Influential Relationships Questionnaire

K-SADS- Kiddle Schedule for Affective Disorders and Schizophrenia for School Age Children

LAS-Life Attitudes Scale (Lewinsohn 1995)

MAPS- Measure for Adolescent Potential for Suicide, MFQ- Mood & Feelings Questionnaire, MCIDI- Munich Composite International Diagnostic Interview

NCHAS- National College Health Assessment Survey, NIMH- National Institute of Mental Health

PANAS- Positive and Negative Affect Schedule, PAQ- Parental Attachment Questionnaire, PBI- Parental Bonding Instrument, PIS- Plutchik's Impulsivity Scale, PIPD- Peer Inventory of Personality Disorders, PPAI- Parent-Peer Attachment Inventory, PVM- Peer Victimization Measure, PTSD- Post Traumatic Stress Disorder

RAAS- Reynold's Adolescent Adjustment Screening, RADS- Reynolds Adolescent Depression Scale, RFLI- Reasons for Living Inventory, RPS/RTSRutter Parents/Teachers Scale, RSES- Rosenberg Self-Esteem Scale, RSCS- Robson's Self Concept Scale

SC90R- Symptom Checklist 90 Revised, SBQ- Suicidal Behaviours Questionnaire, SDQ- Strengths and Difficulties Questionnaire, SHBQ- Self-Harm Behaviour Questionnaire, SNAP- Schedule for Non-Adaptive Personality, SIQ- Suicidal Ideation Questionnaire

TAS- Toronto Alexithymia Scale

WCST- Wisconsin Card Sorting Test
YRBS- Youth Risk Behaviour Survey, YSR- Youth Self Report (Achenbach, 1991)

Table 2: Table of deliberate self-harm definitions and measures

Measure of DSH	Definition of DSH	Details	Studies utilising measures
Mixed Intent DSH Measures (i.e. with or without intent to kill self)			
Adolescent Suicide Questionnaire (Pearce & Martin, 1994)	Not defined Suicidal behaviour/attempts predicted by suicidal ideation, plans, threats, deliberate self-harm and previous attempts	In the past 6 months- Items include: 'Have you ever tried to kill yourself?' 'Have you ever planned or threatened to kill yourself?' 'Have you ever deliberately tried to hurt yourself?' (Never/Yes) Assumption that respondents can distinguish between suicidal and non suicidal deliberate self-harm Asked to further describe frequency and nature. Classed into 5 groups: Ideation, Plans, Threats, DSH, Attempts	Schools: Allison et al (1995); Martin & Waite (199); Martin et al (2004); Richardson et al (2005) Bergen et al (2003)
Modified Beck Suicide Intent Scale (BSI) (Patton et al., 1997)	Not defined Completed suicide attempts often preceded by non fatal suicidal behaviour. Clear links.	In the past year- Items include: 'Have you ever deliberately hurt yourself or done anything that you knew might have harmed or even killed you?' (Yes/No) Over-inclusive to encourage reporting. Then describe method in own words. Coded by raters.	Schools: Patton et al (1997); Patton et al (2007); Wong et al (2007);
Child and Adolescent Self Harm in Europe Survey (CASE)/ ('Lifestyle and Coping Questionnaire')	'Act with a non-fatal outcome in which an individual initiates behaviour (e.g. self-cutting, jumping from a train, hanging) intended to cause self-harm;	In lifetime- Items include: 'Have you ever deliberately taken an overdose (e.g. pills) or tried to harm	Schools: De Leo & Heller (2004); Evans et al (2005); Hawton et al (2002); Morey et al (2008); Ponnet et al (2005); Wichstrom

Measure of DSH	Definition of DSH	Details	Studies utilising measures
	and/or ingests a substance in excess of prescribed dose; and/or ingests a recreational or illicit drug as self-harm; and/or ingests a non-ingestible subs/object'	yourself in some other way (such as cut yourself)?' (Yes/No) If yes, then describe most recent method in own words. Coded by raters.	(2000, 2002) Popn: Nixon et al (2008)
Youth Self Report (YSR) Survey of *The Child Behaviour Checklist (CBCL)* (Achenbach, 1991)	Any non fatal act regardless of intention	In the past 6 months- Items include: 'I think about killing myself' 'I deliberately try to hurt or kill myself' (0-3)	Schools: Liu et al (2005) Popn: Mitchell & Ybarra (2007)
Unnamed Self-Report Questionnaire	Self injurious behaviour with a non-fatal outcome or with intent of hurting or killing self.	In past 6 months: 'I think about killing myself' 'I deliberately try to hurt or kill myself'(0-3 scale) or 'I have tried to hurt myself' 'I have tried to kill myself' (True/False)	Popn: Haavisto et al (2005); Sourander et al (2006);
Unnamed Self-Report Questionnaire	Not defined	'Do you ever deliberately harm yourself with a knife or other sharp object?' (Yes/No) 'Do you ever bang your fist or head against the wall?'	Schools: Izutsu et al (2006); Matsumoto & Imamura (2008)
Unnamed Self-Report Questionnaire	Not defined	'Have you ever tried to harm yourself deliberately?' 'What method did you use?' Cutting body; Scratching or scoring; Taking dangerous pills; Hitting/punching self; slamming hands in door; Burning self;other	Young et al (2007)
Suicidal DSH Measures of DSH (i.e. with intent to kill self)			
Unnamed Self-Report Questionnaire	Ideation, Plans and Attempted Suicide	'I have planned ways to kill myself' (Yes/No) 'I have attempted suicide' (Yes/No)	Schools: Cheng & Chang (2007); Popn: Rodriguez et al (2006)

Measure of DSH	Definition of DSH	Details	Studies utilising measures
Centres for Disease Control & Prevention-Youth Risk Behaviour Surveillance System (CDC-YRBSS) or similar	Ideation, Plans and Attempted Suicide	5 questions: Items include 'Did you seriously consider suicide?' 'Did you tell anyone you thought about killing yourself?' 'Did you make a plan?' 'How many times did you attempt suicide in past year?'	Schools: O'Donnell et al (2004); Wild et al (2004) (similar)
Unnamed self-report	Ideation, Plans and Attempted Suicide	4 progressive questions: In the past 12 months: 'Did you seriously consider suicide?' 'Did you plan suicide?' 'Did you attempt suicide' 'Did you attempt suicide and require medical attention?' 2 attempter and 2 ideator groups similar so authors collapsed into just 2 groups.	Schools: Yip (2005)
Modified Suicidal Manifestations Questionnaire (Johns and Holden 1997)	Ideation and Attempted Suicide	Items include: 'In your lifetime how often have you thought about killing yourself?' 'In your lifetime how often have you attempted suicide?' 'In the future how likely are you to attempt suicide?' 5 point likert scale Used as a continuous variable from ideation to plans to threats to attempts.	Colleges: Edwards & Holden (2001)
Minnesota Multi-Phasic Personality Inventory (MMPI),	Ideation and Attempted Suicide	For the past 12 months. Items include: 'Have you thought about suicide or killing yourself?' 'Were there times you intended to kill yourself?' 'Have you tried to commit suicide?'	Popn: Buddeberg et al (1996);

Measure of DSH	Definition of DSH	Details	Studies utilising measures
Unnamed Self-report	Ideation and Attempted Suicide	Items include: 2 questions for ideation and 2 for attempt e.g. Have you ever thought of killing yourself?' 'Have you ever made an attempt to kill yourself?'	Schools: Eskin et al (2007); Sen (2004); Wagner et al (1995)
Unnamed self-report	Ideation and Attempted Suicide	2 questions only: 'Have you ever seriously thought about committing suicide?' 'Have you eve attempted suicide?'	Colleges: Miller and Day (2002)
National Longitudinal Survey of Children and Youth (NLSCY)	Ideation and Attempted Suicide	In the past 12 months Items include: 'Did you ever seriously consider trying to kill yourself?' 'How many times did you actually try to kill yourself?' 6 point likert scale Then dichotomised for each variable of ideation and attempt.	Popn: Fotti (2006);
National Institute of Mental Health(NIMH) Diagnostic Interview Schedule for Children	Ideation and Attempted Suicide	Child and Parent interviews In the past 6 months: 'Have you thought about killing yourself' 'Have you ever tried to kill yourself?'	Popn: Gould et al (1998)
Youth Risk Behaviour Survey (YBS) *Or similar*	Ideation and Attempted Suicide	Items include: 'Have you ever felt so low you thought about suicide or killing yourself?' Have you ever had a period when you thought about death a lot' 'Were there times you planned to kill yourself?' 'Have you ever attempted suicide?'	Popn: Waldrop et al (2007); Wunderlich et al (2001);
Unnamed Self-Report Questionnaire	Attempted suicide	Items include 2 questions: 'Have you ever tried to take your own	Schools: Borowsky et al (2001); Fleming et al

Measure of DSH	Definition of DSH	Details	Studies utilising measures
		life? Or' Have you tried to commit/attempted suicide?' (Yes/No)	(2007); Flouri & Buchanan (2002); Garrison et al (1993); Tousignant et al (1993); Thompson et al (2005) Colleges: Bronisch et al (2005); Rosow & Wichstrom (1994) Popn: Brezo et al (2007)
National College Health Assessment Survey	Not defined	7 questions on hopelessness, sadness and suicidal mood Categorised as 'seriously considered suicide' and' attempted suicide'	Popn: Kisch (2005);
Non-Suicidal DSH Measures (i.e. without intent to kill self)			
Deliberate Self Harm Inventory (DSHI) (Gratz, 2001)	The deliberate, direct destruction or alteration of body tissue **without** conscious suicidal intent (Favazza 1998)	17 item scale Measures frequency, severity and duration of DSH Includes- cutting, burning, carving, bone-breaking, biting and head banging. Excludes overdose or self-poison	Schools: Bjarehead et al (2008); Lundh et al (2007) Colleges: Brown et al (2007); Gratz et al (2002)
Self Harm Behaviour Questionnaire (SHBQ) (Gutierrez et al., 2001)	The deliberate, direct destruction or alteration of body tissue **without** conscious suicidal intent (Favazza, 1998)	5 general questions followed by free response questions.	Schools: Muehlenkamp & Gutierrez (2004; 2007)
Kiddle Schedule for Affective Disorders and Schizophrenia for School Age Children (K-SADS)	Non-suicidal physically self-damaging acts. 'Intentional injuring of one's body **without** apparent suicidal intent'	'I felt life was not worth living' 'I felt like hurting myself' 'I felt like killing myself'	Schools: Brunner et al (2007); Garrison et al (1993); Lewinsohn et al (2001); McKeown et al (1998)
Whitlock Internet Survey	The deliberate, direct destruction or	'Have you ever done any of the following	Colleges:

Measure of DSH	Definition of DSH	Details	Studies utilising measures
(Whitlock et al., 2006)	alteration of body tissue **without** conscious suicidal intent (Favazza, 1998)	with the intention of hurting yourself?' 16 DSH methods to choose from. Frequency and severity also measure.	Whitlock et al (2006); Whitlock & Knox (2007)
Functional Assessment of Mutilation (FASM) (Lloyd-Richardson et al., 1997)	The deliberate, direct destruction or alteration of body tissue **without** conscious suicidal intent (Favazza 1998)	21 items based on 4 factor model of function of NSSI- (1) Automatic negative reinforcement ('to stop bad feelings'), (2) Automatic positive reinforcement ('to feel something'), (3) Social negative reinforcement ('to avoid doing something unpleasant'), (4) Social positive reinforcement ('to get others to act differently'). Lloyd-Richardson (2007) excluded skin picking due to being non clinical DSH behaviour. Included among others- burning, tattoos, and hitting self	Colleges: Lloyd-Richardson et al (2007); Schools: Yates et al (2008)
Suicide Attempt and Self-Mutilation Questionnaire	The deliberate, direct destruction or alteration of body tissue **without** conscious suicidal intent (Favazza 1998)	Assesses frequency, duration and type DSH. Included- cutting, slashing, burning, pulling hair, banging, hitting body	Schools: Zoroglu et al (2003)
Self Report + interview	The deliberate, direct destruction or alteration of body tissue **without** conscious suicidal intent (Favazza, 1998)	Embedded question- 'hurt myself on purpose' + semi structured interview for DSH endorsers	Schools: Ross & Heath (2002)
Schedule for Non Adaptive Personality (SNAP)- Non-Suicidal Self-Injury Questionnaire (Clark, 1996)	Behaviours performed intentionally and **without** suicidal intent	Assesses functions and frequency of DSH Items: 'When I get very tense, hurting myself helps calm me down' 'I have hurt myself on purpose several times' 'I have tried to commit suicide'(YRBS) Those endorsing last item were excluded	Popn: Klonsky et al (2003)

Measure of DSH	Definition of DSH	Details	Studies utilising measures
Frequency of Activities Scale & Self Mutilative Behaviours Interview (SMBI) (Andover & Pepper, 2002)	Harm to self **without** intent to kill self	History of: Cutting, burning, scratching, interfering with wound healing, needle sticking, self-hitting, bone breaking, or other	Colleges: Andover et al (2007)
Self-Harm Survey (Laye-Gindhu & Schonert-Reichl, 2005)	Deliberate and voluntary physical self-injury that is not life threatening and is **without** any conscious suicidal intent	15 open questions on DSH frequency and methods. 1) Ideation 2) Suicide history 3) DSH action & emotions 4) Risky behaviours 5) Peer DSH 6) Professional help 'Have you ever done anything on purpose to injure, hurt or harm yourself, but you were not trying to kill yourself?' Rater coded. 29 forced-choice questions on motivations for DSH e.g. self-punishment, curiosity. Likert scale.	Schools: Laye-Gindhu & Schonert-Reichl (2005)
Life Attitudes Schedule (LAS) (Lewinsohn et al., 1998)	A continuum of suicide related behaviours from life enhancing to overtly suicidal (Lewinsohn et al 1995)	24-items. Assesses engagement in broad range of risky, life threatening behaviours. 4 subscales: 1) Death related 2) Health related 3) Injury related 4) Self related Scales are combination of negative items endorsed + positive items not endorsed (0-96).	Schools & colleges: Langhinrichsen-Rohling et al (1998)

Appendix B: Correspondence with Directors of Education

Email correspondence with Scottish Educational Research Association (SERA):

Dear Marie-Claire

I am sure you are also seeking guidance from your supervisor at the University. As well as using the SERA ethical guidelines, you may also find the SERA document 'Starting Points for Research in Schools' useful, it is also available on the SERA website. There is indeed an expectation that you get initial permission from the local authority concerned.

Email correspondence with Edinburgh City Council:

Dear Marie-Claire,

I explained in some detail your research project on coping behaviour and self-harm in schools to all secondary head teachers at their meeting on Wednesday, 30 January. I took to the meeting copies of the information you sent to me. I asked head teachers to speak to me at that point, or after the meeting, if they were willing to participate in this research. Unfortunately nobody volunteered. I think there are two reasons why we got no volunteers for this particular research. Firstly, schools have been inundated recently with requests to participate in research projects and secondly the sensitive nature of this subject. This is also a particularly busy time in schools and resources are stretched to the limit. I hope this helps.

Email correspondence with Director of Education for West Lothian:

Dear Marie-Claire

I confirm that you can make direct contact with school Head Teachers in West Lothian. I cannot guarantee cooperation however, since our schools receive very many requests for research support each year. Good luck with your project.

Email correspondence with Mid-Lothian Director of Education

Yes I have approved this following our discussion. We look forward to receiving feedback in due course.

Appendix C: Correspondence with Secondary Schools

Re: Research on Gender Differences in Self-harming Behaviour in Adolescents: Attachment, and Emotion.

I am a final year Trainee Clinical Psychologist conducting my doctoral research on self-harming behaviour in adolescents in conjunction with Consultant Clinical Psychologist Matthias Schwannauer and under the supervision of Clinical Psychologist Dr. Jill Cossar.

As part of this study, we plan to recruit a community sample of adolescents between the ages of 13 and 19 years old, with the aim of exploring gender differences in self harming behaviour and relationships with mood, emotion, attachment and recent life events, using validated self-report questionnaires. For those schools choosing to participate, general information about the study would be relayed by me to school pupils in small groups, form classes or other appropriate forums. Pupils would then be given a copy of the study information sheet and allowed no less than a day in which to read and consolidate the information. The following day, pupils who wished to participate in the study would sign a consent form detailing that they had read and understood the study information sheet and consented to participate in the study.

It will be at the school's discretion to decide where and when this can be fitted into the daily routine. For example, similar research in the past has been conducted during social education classes, requiring one to three visits to the school at a time deemed convenient for them. It is therefore anticipated that participating pupils would complete self-report questionnaires within class time, and that this would take no longer than 30 minutes. However, where this was not possible, pupils could complete questionnaires in their own time and leave them in a box to be collected later. Pupils will of course be free to withdraw from the study at any time, and all information collected will be anonymous and confidential. My services as a Trainee Clinical Psychologist will be made available to any pupils wishing to discuss personal issues relating to this research after completion of the questionnaires. Leaflets and self-help material will also be provided for distribution.

I have enclosed a copy of the consent form and information sheet and a list of measures which will be used. I would be extremely grateful if you could contact me on the above number with any queries or concerns you have regarding this study, or indeed if you wish to discuss this study in more detail.

Yours sincerely

Appendix D: Correspondence with Universities and Colleges

Email to College and University Departments

I am a final year Clinical Psychology Trainee in the School of Health in Social Science (Edinburgh University), and as part of my doctorate, I am conducting a survey about mood, relationships and coping behaviour in young people. (Please find my University of Edinburgh ethical approval letter attached).

If you are happy for your students to be approached, I was wondering if it would be possible for you to forward the 'online survey' link to the email addresses of only first year undergraduates (i.e. 16- 24 year olds)? Students can then choose to click on the link and complete the survey or not. It is anonymous and confidential, and takes approximately 20 minutes to complete.
I will shortly send you this 'link' from an email address set up specifically for the survey (wellbeingsurvey@gmail.com), which you can then forward on to all your first year students. If you have any queries regarding this, or wish to discuss this further, please contact me.

Please find attached the link to my online survey, concerning mood, relationships and coping behaviour in young people. I am conducting this survey as part of my Clinical Psychology doctoral thesis, looking at wellbeing in young people. If you are between 16 and 24 years old, then you are invited to take part. This survey is completely anonymous and confidential (all IP addresses are hidden and all responses are encrypted), and will take approximately 15 minutes to complete. Please feel free to contact me in confidence at this email address (wellbeingsurvey@gmail.com) if you have any questions regarding this survey. Please click on the link below to take you to the survey: (http://www.surveymonkey.com/s.aspx?sm=CMg4nLGKMS_2b0AbEvs1Cs8g_3d_3d)

Appendix E: Consent form and Information Sheet

CONSENT FORM

Please initial box

1 I confirm that I have read and understand the information sheet dated _____ (Version 1) for the above study and have had the opportunity to ask questions. ☐

2 I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my medical care or legal rights being affected. ☐

3 I agree to take part in the above study. ☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of Person taking consent (if different from researcher)	Date	Signature
_____	_____	_____
Researcher	Date	Signature

1 for participant; 1 for researcher

Information Sheet
Coping and Risk in Adolescence

If you are a student between 13 and 19 years old, this is an invitation for you to take part in this project. Please read all of the information below, which will help you to decide if you want to take part.

What is the purpose of the study?
We hope to gather information about mood, relationships, and coping behaviours, such as deliberate self-harm, which are sometimes used by adolescents to deal with distress. Deliberate self-harm is the act of intentionally injuring yourself e.g. by cutting or scratching your body. About 6% of teenagers self-harm as a way of dealing with difficult feelings, relationships or stressful things happening in their lives. This study aims to further explore the reasons why some teenagers use self-harm as a way of coping, and the differences between those who do self-harm and those who don't. We therefore want to hear from everybody, regardless of whether or not you have ever self-harmed.

Do I have to take part?
No! The project is *VOLUNTARY*, so it is up to you to decide whether or not to take part. You are free to withdraw from the study at any time, without giving a reason. If you don't take part it will not in any way affect you.

What will I be asked to do if I take part?
You will be given this sheet to keep. Next week, if you agree to take part, you'll be asked to sign a consent form to say you have read and understood the information given. This form will be collected separately from your questionnaire. You will then be asked to fill in a questionnaire about mood, relationships, coping and self-harm. This should take about 25 minutes to complete. Questionnaires are all *ANONYMOUS* (no names or birth dates) *& CONFIDENTIAL* (information will be stored securely, and viewed only by me).

What are the advantages and disadvantages of taking part?
By taking part you are helping us to better understand the reasons for different coping behaviours in young people. This means we can do more to help and support people who engage in behaviours such as self-harm. However, when taking part, some people may find it raises important and personal issues for them.

What if I have any questions or worries?
If you are upset or troubled by any of the issues raised, and would like to discuss these:
-Talk to me in confidence (after the questionnaire completion) or contact me in confidence at *wellbeingsurvey@gmail.com.*
-Talk to someone you trust e.g. a parent, sibling, teacher or your family doctor.
-Check out the 'self-help' sheet which you'll receive next week for useful advice and contacts.

Thank you very much for your time
Marie-Claire Whyte (Trainee Clinical Psychologist)

Parental Opt-out of Research Form

All of the pupils at _____ have been invited to take part in a research study. This study is being conducted by Clinical Psychology at the Young People's Unit in Edinburgh in conjunction with the Clinical Psychology Department of the University of Edinburgh.

It will involve pupils completing a series of multiple choice questionnaires about coping behaviour, e.g. deliberate self harm, mood and relationships, and will last approximately 25 minutes.

Pupils are aware that they do not have to participate if they don't want to and are free to withdraw from the study at any time. All information collected will be anonymous and confidential. A Psychologist will be available at the end of the session, if any pupils wish to speak confidentially about any issues raised.

Pupils have been briefed on the details of this study, and issued with information sheets, and self-help literature. Those pupils who wish to take part will sign a consent form to acknowledge that they have read and understood the information sheet and are willing to participate in the study.

As a parent/guardian, if you feel strongly that your child '**should not**' be allowed to participate in this research study, then please complete and sign the slip below and return to the school by the end of the week.

Thank you

Parent/Guardian's Name:

_____

Parent/Guardian's Signature: _____

Child's Name: _____

Child's Year Group: _____

Information on self-harm for young people

What is self-harm?

Self-harm is where someone does something to deliberately hurt him or herself. This may include cutting parts of the body, burning, hitting or taking an overdose.

How many young people self-harm?

A large study in the UK found that about 7% of 15-16 year olds had self-harmed in the past year.

Why do young people self-harm?

Self-harm is often a way of trying to cope with painful and confusing feelings. Difficult things that people who self-harm talk about include:

- feeling sad or worried
- not feeling very good or confident about themselves
- being hurt by others: physically, sexually or emotionally
- feeling under a lot of pressure at school or home
- losing someone close, such as someone dying or leaving

When difficult or stressful things happen in a person's life it can trigger self-harm. Upsetting events that might lead to self-harm include:

- arguments with family or friends
- break-up of a relationship
- failing, or thinking you're going to fail, exams
- being bullied

Often these things build up until the young person feels he or she cannot cope anymore. Self-harm can be a way of trying to deal with or escaping from these difficult feelings. It can also be a way of the person showing other people that something is wrong in his or her life.

How can you cope with self-harm?

Replacing the self-harm with other, safer, coping strategies can be a positive and more helpful way of dealing with difficult things in your life. Helpful strategies can include:

- finding someone to talk to about your feelings, such as a friend or family member
- talking to someone on the phone, e.g. you might want to ring a helpline (see contact page for numbers)
- writing down and drawing about your feelings, because sometimes it can be hard to talk about feelings
- scribbling on and ripping up paper
- listening to music
- going for a walk, run or other exercise
- getting out of the house and going somewhere where there are other people
- keeping a diary
- having a bath with relaxing oils

- hitting a pillow or other soft object
- watching a favourite film

My friend has a problem, how can I help?

- You can really help by just being there, listening and giving them support
- Try to be open and honest. If you are worried about your friend's safety then tell an adult. Let your friend know you are going to do this and that it is because you care about him or her.
- Encourage your friend to get help. You can go with your friend or tell someone he or she wants to know about
- Get information from helplines, websites, the library etc. This can help you to understand what your friend is experiencing.
- Your friendship may be changed by the problem. You may feel bad that you cannot help your friend or feel guilty if you have had to tell other people. These feelings are common and don't mean that you have done something wrong or not done enough.
- Your friend may get angry with you or tell you that you don't understand. It is important not to take this personally. Often, when people are feeling bad about themselves, they get angry with the people they are closest to.
- It can be difficult to look after someone who is having difficulties. It is important for you to talk to an adult who can support you. You may not always be able to be there for your friend, and that's ok.

1

[1]

Getting help

In the longer term it is important that the young person learns to understand and deal with the causes of stress that he or she feels. The support of someone who understands and will listen can be very helpful in facing difficult feelings.

- *At home:* Parents, brother/sister, or other trusted family member
- *In school:* School counsellor, guidance teacher, school nurse, other teacher or trusted member of staff
- *GP:* You can talk to your GP about your difficulties and they can refer you to a counsellor
- *Website:* Interactive website (Young People's Unit) http://www.depressioninteenagers.co.uk/

- ***Help lines:***
  - Childline 0800 1111
  - Samaritans 08547 909090 or email jo@samaritans.org
  - NHS Direct 0845 4647
  - Penumbra 01506 859 423
  - MIND info line 0845 766 0163 or http://www.mind.org.uk/
  - Young Minds 020 8772 9900 or http://www.youngminds.org.uk/

Appendix F: Questionnaire Measures

Question 1a: Below are some statements containing behaviours of parents. Next to each statement, place a cross in the box which best describes how you remember your **MOTHER** in your first 16 years of life. If this is not relevant, please indicate why and skip to the next question.

	My mother--	**Very like**	**Like**	**Unlike**	**Very unlike**
	e.g. Spoke to me in a warm and friendly voice		*X*		
1.	Spoke to me in a warm and friendly voice				
2.	Did not help me as much as I needed				
3.	Let me do those things I liked doing				
4.	Seemed emotionally cold to me				
5.	Appeared to understand my problems				
6.	Was affectionate to me				
7.	Liked me to make my own decisions				
8.	Did not want me to grow up				
9.	Tried to control everything I did				
10.	Invaded my privacy				
11.	Enjoyed talking things over with me				
12.	Frequently smiled at me				
13.	Tended to baby me				
14.	Did not seem to understand what I needed				
15.	Let me decide things for myself				
16.	Made me feel I wasn't wanted				
17.	Could make me feel better when I was upset				
18.	Did not talk with me very much				
19.	Tried to make me feel dependent on her				
20.	Felt I couldn't look after myself unless she was around				
21.	Gave me as much freedom as I wanted				
22.	Let me go out as often as I wanted				
23.	Was overprotective of me				
24.	Did not praise me				
25.	Let me dress in any way I pleased				

Why is this not relevant to you?_____

Question 1b: Below are some statements containing behaviours of parents. Next to each statement, place a tick or cross in the box which best describes how you remember your **FATHER** in your first 16 years of life. If this is not relevant to you, then please indicate why at the end and then skip to the next question.

	My father--	**Very like**	**Like**	**Unlike**	**Very unlike**
	e.g. Spoke to me in a warm and friendly voice		*X*		
1.	Spoke to me in a warm and friendly voice				
2.	Did not help me as much as I needed				
3.	Let me do those things I liked doing				
4.	Seemed emotionally cold to me				
5.	Appeared to understand my problems				
6.	Was affectionate to me				
7.	Liked me to make my own decisions				
8.	Did not want me to grow up				
9.	Tried to control everything I did				
10.	Invaded my privacy				
11.	Enjoyed talking things over with me				
12.	Frequently smiled at me				
13.	Tended to baby me				
14.	Did not seem to understand what I needed				
15.	Let me decide things for myself				
16.	Made me feel I wasn't wanted				
17.	Could make me feel better when I was upset				
18.	Did not talk with me very much				
19.	Tried to make me feel dependent on him				
20.	Felt I couldn't look after myself unless he was around				
21.	Gave me as much freedom as I wanted				
22.	Let me go out as often as I wanted				
23.	Was overprotective of me				
24.	Did not praise me				
25.	Let me dress in any way I pleased				

Why is this not relevant to you?_____

Question 2a: Below are descriptions of four general relationship styles that. Please read each description and circle the letter corresponding to the description that best describes you or is closest to the way you generally are.

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

Question 2b: Please rate each of the four relationship styles below according to the extent to which you think each description corresponds to your style. Circle the number corresponding to your rating of each style.

Styles	Not at all like me			Some what like me			Very much like me
A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.	1	2	3	4	5	6	7
B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.	1	2	3	4	5	6	7
C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.	1	2	3	4	5	6	7
D. I am comfortable without close emotional relationships, It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.	1	2	3	4	5	6	7

Question 3: Below are some statements. For each item, please indicate how true each statement is for you by placing a cross in the box.

Statements	Very true	Some what true	Some what false	Very false
e.g. How I dress is important to me.		X		
A person's family is the most important thing in life.				
Even if something bad is about to happen to me, I rarely experience fear or nerves.				
I go out of my way to get the things I want.				
When I'm doing well at something I love to keep at it.				
I'm always willing to try something new if I think it will be fun.				
How I dress is important to me.				
When I get something I want, I feel excited and energized.				
Criticism hurts me quite a bit.				
When I want something I usually go all-out to get it.				
I will often do things for no other reason than that they might be fun.				
It's hard for me to find the time to do things such as get a haircut.				
If I see a chance to get something I want I move on it right away.				
I feel pretty worried or upset when I think or know somebody is angry at me.				
When I see an opportunity for something I like I get excited right away.				
I often act on the spur of the moment.				
If I think something unpleasant is going to happen I usually get pretty "worked up."				
I often wonder why people act the way they do.				
When good things happen to me, it affects me strongly.				
I feel worried when I think I have done poorly at something important.				
I crave excitement and new sensations.				
When I go after something I use a "no holds barred" approach.				
I have very few fears compared to my friends.				
It would excite me to win a contest.				
I worry about making mistakes.				

Question 4: Below are some statements about future expectations. If the statement generally describes how you think about the future, then circle 'True', and if not 'False'.

1.	I look forward to the future with hope and enthusiasm	True	False
2.	I might as well give up because I can't make things better	True	False
3.	When things are going badly I am helped by knowing that they can't stay that way for ever	True	False
4.	I can't imagine what my life would be like in 10 years.	True	False
5.	I have enough time to accomplish the things I want to do.	True	False
6.	In the future I expect to succeed in what concerns me most	True	False
7.	My future seems dark to me	True	False
8.	I expect to get more of the good things in life than the average person	True	False
9.	I just don't get the breaks, and there's no reason to believe I will in the future	True	False
10.	My past experiences have prepared me well for my future.	True	False
11.	All I can see ahead of me is unpleasantness rather than pleasantness.	True	False
12.	I don't expect to get what I really want	True	False
13.	When I look ahead to the future I expect that I will be happier than I am now	True	False
14.	Things just don't work out the way I want them to	True	False
15.	I have great faith in the future	True	False
16.	I never get what I want so it is foolish to want anything.	True	False
17.	It is very unlikely that I will get any real satisfaction in the future	True	False
18.	The future seems vague and uncertain to me	True	False
19.	I can look forward to more good times than bad times	True	False
20.	There's no use in really trying to get something I want because I probably won't get it	True	False

Question 5: Below are some statements about how people react to certain situations. Please indicate how much you agree or disagree with each statement by placing a cross in the corresponding box.

		Strongly agree	**Agree**	**Neither agree or disagree**	**Disagree**	**Strongly disagree**
e.g.	*I would like to explore strange places*				X	
1.	I would like to explore strange places					
2.	I get restless when I spend too much time at home					
3.	I like to do frightening things					
4.	I like wild parties					
5.	I would like to take off on a trip with no pre-planned routes or timetables					
6.	I prefer friends who are excitingly unpredictable					
7.	I would like to try bungee jumping					
8.	I would love to have new and exciting experiences, even if they are illegal					

Question 6: Students often have concerns or worries. Below is a list of ways in which people can try to cope with their worries. Please indicate by placing a cross in the box, how often you would use the strategies listed below, to cope with your worries.

	Statements	**Don't use**	**Used very little**	**Used some-times**	**Used often**	**Used great deal**
	E.g. Talk to other people about my concern to help me sort it out			*X*		
1.	Talk to other people about my concern to help me sort it out					
2.	Work at solving the problem to the best of my ability					
3.	Work hard					
4.	Worry about what will happen to me					
5.	Spend more time with boy/girl-friend					
6.	Improve my relationship with others					
7.	Wish a miracle would happen					
8.	I have no way of dealing with the situation					
9.	Find a way to let of steam e.g. cry, scream, shout, take alcohol/drugs					
10.	Meet with people who have the same concern					
11.	Shut myself off from the problem so I can avoid it					
12.	See myself as being at fault					
13.	Don't let others know how I am feeling					
14.	Pray for help and guidance so that everything will be alright					
15.	Look on the bright side of things and think of all that's good					
16.	Ask a professional person for help					
17.	Make time for leisure activities					
18.	Keep fit and healthy					
	Please list any other things you do to help you cope with worries:					

Question 7: Below is a list of statements describing moods and feelings. Please choose 1 response for each statement which describes how you feel **THIS WEEK**. Place a cross in the box next to your response.

	Statements	*		**Statements**	*
1.	**I feel tense and wound up**		8.	**I get a sort of frightened feeling like butterflies in my stomach**	
	Most of the time			Not at all	
	A lot of the time			Occasionally	
	From time to time/occasionally			Quite often	
	Not at all			Very often	
2.	**I still enjoy the things I used to enjoy**		9.	**I have lost interest in my appearance**	
	Definitely as much			Definitely	
	Not quite so much			I don't take as much care as I should	
	Only a little			I may not take quite as much care	
	Hardly at all			I take just as much care as ever	
3.	**I get a sort of frightened feeling like something awful is about to happen**		10.	**I feel restless as if I have to be on the move**	
	Very definitely and quite badly			Very much indeed	
	Yes, but not too badly			Quite a lot	
	A little, but it doesn't worry me			Not very much	
	Not at all			Not at all	
4.	**I can laugh and see the funny side of things**		11.	**I look forward with enjoyment to things**	
	As much as I always could			As much as I ever did	
	Not quite so much now			Less than I used to	
	Definitely not so much now			Definitely less	
	Not at all			Hardly at all	
5.	**Worrying thought go through my mind**		12.	**I can enjoy a good book or TV program**	
	A great deal of the time			Often	
	A lot of the time			Sometimes	
	From time to time			Not often	
	Only occasionally			Very seldom	
6.	**I feel cheerful**		13.	**I get sudden feelings of panic**	
	Not at all			Very often	
	Not often			Quite often	
	Sometimes			Not often	
	Most of the time			Not at all	
7.	**I can sit at ease and feel relaxed**		14.	**I feel as if I am slowed down**	
	Nearly all the time			Nearly all the time	
	Very often			Very often	
	Sometimes			Occasionally	
	Not at all			Not at all	

Question 8a: Below are some questions about deliberate self-harm. Please think about whether you have 'thought' or 'done' any of the following in the **PAST YEAR**. Please place a cross in the appropriate box.

	No	Yes			
Have you had any thoughts of deliberately harming yourself in the past year?					
	Never	Infrequent	Monthly	Weekly	Daily
How frequent have these thoughts been?					

Question 8b: If you indicate **'yes'** to any item please also indicate **'how many times'** you did it and **'how serious'** a problem you think it was by putting one of the following codes below in the relevant box:

How many times?
1 = once
2 = 2-10 times
3 = 11-20 times
4 = more than 20 time

How serious?
1 = not at all serious
2 = quite serious
3 = moderately serious
4 = verv serious

	1A. Have you done any of the following in the *PAST YEAR*?	**No**	**Yes**	**If yes, how many times?**	**If yes, how serious ?**
	E.g. Deliberately cut yourself		*X*	*3*	*1*
1.	Deliberately drank excessive alcohol (enough to harm)				
2.	Deliberately taken an overdose of drugs/medication				
3.	Deliberately drank poison or something toxic				
4.	Deliberately burned or scalded yourself				
5.	Deliberately cut yourself				
6.	Deliberately cut words or symbols into your skin				
7.	Deliberately made scratches on your skin				
8.	Deliberately stabbed/wounded yourself				
9.	Deliberately hit/punched yourself				
10.	Deliberately stopped a wound from healing				
11.	Deliberately bitten yourself				
12.	Something else? Please describe:				

*** If you indicated that you have NOT self-harmed in the past year, then you do not need to complete the next question.**

Question 9: Below is a list of 36 reasons people may have for injuring themselves. For each reason, circle a number on the scale of 0-10 which best reflects **how much of the time** your own self-injury has been due to that reason.

Circle a **"0"** if it has always been one of your reasons;
Circle a number between **"1 and 9"** if it has been a reason of yours, but not all the time;
Circle **"10"** if it has never been one of your reasons.

I HAVE INJURED MYSELF:

1. To provide a sense of excitement or stimulation that feels exhilarating

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

2. To "protect" important people in my life

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

3. To produce feelings and a sense of being real when I feel numb and "unreal"

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

4. To diminish a feeling of being utterly alone

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

5. To control the reactions of others

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

6. To distract myself from emotional pain by experiencing physical pain

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

7. To punish myself for positive feelings or experiences

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

8. To decrease feelings of fear

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

9. To prevent myself from acting on suicidal feelings

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

10. To produce a feeling of distance or numbness when my feelings are too strong or overwhelming

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

11. To satisfy voices inside or outside of me telling me to do it

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

12. To punish myself for telling secrets

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

13. To prevent myself from hurting someone else

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

14. To "kill" a part of myself

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

15. To decrease feelings of rage

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

16. To hurt someone important in my life

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

17. To punish myself for being "bad" in some way (angry, selfish, stupid, etc.)

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

18. To express anger at, or to seek revenge towards others

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

19. To remind myself that I deserve to be hurt or punished

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

20. To keep bad memories away

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

21. To show others how hurt (damaged, hopeless) I am

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

22. To do something that only I have control of and no-one else can control

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

23. To please an important figure (God, the Devil, etc.) who wants me to do it

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

24. To provide a sense of tension release that feels like sexual release

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

25. To show others how angry I am

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

26. To remind myself that I'm alive when I otherwise feel "dead"

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

27. To diminish feeling so "empty"

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

28. To irritate or shock someone in my life

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

29. To control parts of myself that would otherwise control me

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

30. To diminish feelings of sexual arousal

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

31. To experience a "high" that feels like a drug high

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

32. To show others how strong or "tough" I am

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

33. To help me escape from uncomfortable feelings or moods

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

34. To seek support and caring from others when I cant or wont ask them directly

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

35. To prove to myself how much I can take

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

36. It makes no sense to me; I don't know why I do it and it seems to serve no function

0 1 2 3 4 5 6 7 8 9 10

(Always) (Never)

If you have a reason for harming yourself that is not include in the list above, please state it below:

.....

.....

Appendix G: Preparation for Statistical Analysis

Table 3: Normality Tests for School Sample

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CARE_MUM	.135	124	.000	.918	124	.000
OVERPROTECT_MUM	.140	124	.000	.962	124	.001
CARE_DAD	.131	124	.000	.900	124	.000
OVERPROTECT_DAD	.126	124	.000	.939	124	.000
MAIN_STYLE	.279	124	.000	.771	124	.000
BIS_TOTAL	.093	124	.010	.980	124	.061
BAS_Total	.085	124	.028	.989	124	.396
BASDRIVE	.097	124	.006	.969	124	.006
BASFUN	.115	124	.000	.962	124	.001
BASREWARD	.111	124	.001	.953	124	.000
SS_TOTAL	.078	124	.059	.984	124	.136
EXPERIENCE	.138	124	.000	.947	124	.000
BOREDOM	.121	124	.000	.961	124	.001
THRILL_ADVENTURE	.123	124	.000	.950	124	.000
DISINHIBITION	.101	124	.003	.950	124	.000
BHSTOTAL	.204	124	.000	.808	124	.000
HADSA_2	.098	124	.005	.973	124	.015
HADSD_2	.190	124	.000	.909	124	.000
SP_ADJUSTED	.088	124	.021	.972	124	.011
RO_ADJUSTED	.121	124	.000	.968	124	.005
NPC_ADJUSTED	.078	124	.060	.965	124	.003

a. Lilliefors Significance Correction

Table 4: Normality Tests for College/University Sample

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CARE_MUM	.118	433	.000	.968	433	.000
OVERPROTECT_MU	.106	433	.000	.984	433	.000
CARE_DAD	.105	433	.000	.931	433	.000
OVERPROTECT_DAI	.107	433	.000	.972	433	.000
MAIN_STYLE	.192	433	.000	.871	433	.000
BIS_TOTAL	.098	433	.000	.962	433	.000
BAS_TOTAL	.055	433	.003	.995	433	.196
BASDRIVE	.074	433	.000	.986	433	.000
BASFUN	.082	433	.000	.978	433	.000
BASREWARD	.112	433	.000	.962	433	.000
SS_TOTAL	.049	433	.014	.989	433	.002
EXPERIENCE	.131	433	.000	.944	433	.000
BOREDOM	.106	433	.000	.969	433	.000
THRILL_ADVENTURE	.093	433	.000	.966	433	.000
DISINHIBITION	.096	433	.000	.967	433	.000
BHSTOTAL	.137	433	.000	.871	433	.000
HADSA_2	.076	433	.000	.989	433	.003
HADSD_2	.136	433	.000	.921	433	.000
SP_ADJUSTED	.078	433	.000	.988	433	.001
RO_ADJUSTED	.083	433	.000	.983	433	.000
NPC_ADJUSTED	.045	433	.037	.993	433	.054

a. Lilliefors Significance Correction

Table 5: Missing Values Analysis for School Sample

Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes(a,b)	
	Count	Per cent	Low	High	Count	Per cent	Low
BHS1	133	.08	.265	4	2.9	.	.
BHS2	134	.09	.287	3	2.2	.	.
BHS3	134	.19	.391	3	2.2	.	.
BHS4	134	.39	.489	3	2.2	0	0
BHS5	134	.26	.441	3	2.2	0	0
BHS6	134	.19	.391	3	2.2	.	.
BHS7	133	.11	.318	4	2.9	.	.
BHS8	132	.42	.496	5	3.6	0	0
BHS9	129	.19	.397	8	5.8	.	.
BHS10	133	.25	.434	4	2.9	.	.
BHS11	133	.09	.288	4	2.9	.	.
BHS12	133	.44	.498	4	2.9	0	0
BHS13	133	.26	.442	4	2.9	0	0
BHS14	133	.30	.460	4	2.9	0	0
BHS15	132	.25	.435	5	3.6	0	0
BHS16	132	.11	.309	5	3.6	.	.
BHS17	132	.14	.352	5	3.6	.	.
BHS18	132	.42	.496	5	3.6	0	0
BHS19	132	.09	.289	5	3.6	.	.
BHS20	131	.14	.346	6	4.4	.	.
PBI_MUM1	133	2.50	.572	4	2.9	1	0
PBI_MUM2	133	2.25	.829	4	2.9	5	0
PBI_MUM3	134	.73	.748	3	2.2	0	3
PBI_MUM4	131	2.60	.751	6	4.4	4	0
PBI_MUM5	133	2.25	.839	4	2.9	6	0
PBI_MUM6	135	2.42	.717	2	1.5	2	0
PBI_MUM7	134	.78	.656	3	2.2	0	0
PBI_MUM8	133	1.02	.883	4	2.9	0	12
PBI_MUM9	134	.69	.770	3	2.2	0	6
PBI_MUM10	134	.81	.886	3	2.2	0	10
PBI_MUM11	135	2.10	.827	2	1.5	6	0
PBI_MUM12	135	2.33	.761	2	1.5	4	0
PBI_MUM13	134	1.13	.948	3	2.2	0	0
PBI_MUM14	135	2.19	.868	2	1.5	6	0
PBI_MUM15	134	.86	.747	3	2.2	0	4
PBI_MUM16	133	2.63	.743	4	2.9	.	.
PBI_MUM17	134	2.22	.862	3	2.2	7	0
PBI_MUM18	134	2.37	.846	3	2.2	6	0
PBI_MUM19	132	.97	.856	5	3.6	0	0
PBI_MUM20	133	.68	.792	4	2.9	0	4
PBI_MUM21	134	1.28	.810	3	2.2	0	0
PBI_MUM22	134	1.24	.796	3	2.2	0	0

PBI_MUM23	134	1.16	.821	3	2.2	0	0
PBI_MUM24	135	2.34	.874	2	1.5	6	0
PBI_MUM25	135	.82	.781	2	1.5	0	3
PBI_DAD_1	125	2.08	.894	12	8.8	9	0
PBI_DAD_2	125	2.06	.914	12	8.8	0	0
PBI_DAD_3	124	.79	.757	13	9.5	0	4
PBI_DAD_4	124	2.36	.896	13	9.5	7	0
PBI_DAD_5	125	1.60	.916	12	8.8	0	0
PBI_DAD_6	123	2.13	.868	14	10.2	8	0
PBI_DAD_7	124	.99	.897	13	9.5	0	11
PBI_DAD_8	122	1.05	.978	15	10.9	0	0
PBI_DAD_9	124	.84	.940	13	9.5	0	11
PBI_DAD_10	124	.70	.846	13	9.5	0	7
PBI_DAD_11	124	1.76	.949	13	9.5	0	0
PBI_DAD_12	125	2.14	.922	12	8.8	9	0
PBI_DAD_13	125	.95	.932	12	8.8	0	12
PBI_DAD_14	125	2.00	.916	12	8.8	0	0
PBI_DAD_15	125	.94	.826	12	8.8	0	8
PBI_DAD_16	125	2.58	.844	12	8.8	.	.
PBI_DAD_17	125	2.01	.955	12	8.8	15	0
PBI_DAD_18	125	2.23	.908	12	8.8	8	0
PBI_DAD_19	123	.89	.851	14	10.2	0	7
PBI_DAD_20	124	.61	.773	13	9.5	0	5
PBI_DAD_21	125	1.23	.872	12	8.8	0	0
PBI_DAD_22	125	1.35	.882	12	8.8	0	0
PBI_DAD_23	124	1.10	.905	13	9.5	0	0
PBI_DAD_24	124	2.35	.912	13	9.5	8	0
PBI_DAD_25	125	1.08	.912	12	8.8	0	0
B1	137	3.49	.596	0	.0	1	0
B2	137	3.04	.865	0	.0	7	0
B3	135	2.55	.808	2	1.5	0	0
B4	133	3.68	.513	4	2.9	1	0
B5	137	3.55	.594	0	.0	1	0
B6	135	3.38	.771	2	1.5	4	0
B7	137	3.53	.607	0	.0	0	0
B8	135	2.87	.845	2	1.5	0	0
B9	135	2.50	.880	2	1.5	0	0
B10	136	2.93	.866	1	.7	0	0
B11	137	1.93	.929	0	.0	0	10
B12	137	2.76	.762	0	.0	0	0
B13	137	3.04	.848	0	.0	7	0
B14	137	3.07	.703	0	.0	2	0
B15	134	2.89	.772	3	2.2	0	0
B16	137	2.93	.901	0	.0	0	0
B17	134	3.26	.785	3	2.2	3	0
B18	135	3.16	.690	2	1.5	2	0
B19	136	3.35	.736	1	.7	3	0
B20	135	2.99	.837	2	1.5	0	0

B21	127	2.39	.837	10	7.3	0	0
B22	135	2.57	.910	2	1.5	0	0
B23	136	3.46	.709	1	.7	3	0
B24	136	2.96	.868	1	.7	0	0
SSS_1	134	2.34	1.019	3	2.2	0	4
SSS_2	135	2.40	1.121	2	1.5	0	5
SSS_3	134	2.98	1.247	3	2.2	0	0
SSS_4	135	2.35	1.266	2	1.5	0	0
SSS_5	135	2.89	1.412	2	1.5	0	0
SSS_6	134	2.72	1.199	3	2.2	0	12
SSS_7	135	2.64	1.468	2	1.5	0	0
SSS_8	135	2.99	1.319	2	1.5	0	0
HADS1	128	1.23	.748	9	6.6	0	0
HADS2	127	.72	.712	10	7.3	0	3
HADS3	127	1.42	.988	10	7.3	0	0
HADS4	128	.26	.506	9	6.6	.	.
HADS5	127	1.46	.949	10	7.3	0	0
HADS6	128	.47	.752	9	6.6	0	4
HADS7	127	1.21	.783	10	7.3	0	0
HADS8	127	1.24	.732	10	7.3	0	0
HADS9	127	.57	.822	10	7.3	0	4
HADS10	127	1.41	.848	10	7.3	0	0
HADS11	127	.31	.573	10	7.3	0	2
HADS12	127	.57	.850	10	7.3	0	7
AC_1	125	3.26	1.263	12	8.8	0	0
AC_2	124	3.71	1.026	13	9.5	4	0
AC_3	124	3.92	.861	13	9.5	0	0
AC_4	122	3.35	1.178	15	10.9	8	0
AC_5	122	2.73	1.233	15	10.9	0	0
AC_6	124	3.82	1.972	13	9.5	1	1
AC_7	124	3.38	1.383	13	9.5	0	0
AC_8	125	2.11	1.033	12	8.8	0	0
AC_9	125	3.08	1.440	12	8.8	0	0
AC_10	124	2.25	1.152	13	9.5	0	0
AC_11	124	2.56	1.302	13	9.5	0	0
AC_12	123	2.51	1.302	14	10.2	0	0
AC_13	123	2.72	1.440	14	10.2	0	0
AC_14	123	2.41	1.305	14	10.2	0	0
AC_15	124	3.40	1.268	13	9.5	12	0
AC_16	124	1.78	1.180	13	9.5	0	14
AC_17	124	3.40	1.249	13	9.5	13	0
AC_18	124	3.47	1.165	13	9.5	8	0

a Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).
b . indicates that the inter-quartile range (IQR) is zero.

Table 6: Missing Values Analysis for College/University Sample

Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes(a)	
	Count	Per cent	Low	High	Count	Per cent	Low
PBI_MUM1	366	.48	.661	79	17.8	0	22
PBI_MUM2	366	2.36	.876	79	17.8	18	0
PBI_MUM3	366	.73	.691	79	17.8	0	9
PBI_MUM4	366	2.65	.668	79	17.8	30	0
PBI_MUM5	366	.95	.822	79	17.8	0	18
PBI_MUM6	366	.42	.631	79	17.8	0	22
PBI_MUM7	366	.73	.761	79	17.8	0	11
PBI_MUM8	366	1.93	.946	79	17.8	37	0
PBI_MUM9	366	2.14	.876	79	17.8	21	0
PBI_MUM10	366	2.10	.856	79	17.8	19	0
PBI_MUM11	366	.80	.827	79	17.8	0	13
PBI_MUM12	366	.54	.715	79	17.8	0	36
PBI_MUM13	366	1.99	.913	79	17.8	27	0
PBI_MUM14	366	2.08	.815	79	17.8	14	0
PBI_MUM15	366	.77	.716	79	17.8	0	7
PBI_MUM16	366	2.74	.632	79	17.8	24	0
PBI_MUM17	366	.83	.859	79	17.8	0	17
PBI_MUM18	366	2.48	.735	79	17.8	41	0
PBI_MUM19	366	2.39	.775	79	17.8	10	0
PBI_MUM20	366	2.33	.849	79	17.8	15	0
PBI_MUM21	366	1.38	.885	79	17.8	0	0
PBI_MUM22	366	1.40	.870	79	17.8	0	0
PBI_MUM23	366	1.81	.924	79	17.8	0	0
PBI_MUM24	366	2.39	.849	79	17.8	15	0
PBI_MUM25	366	.87	.813	79	17.8	0	17
PBI_DAD_1	334	.79	.854	111	24.9	0	14
PBI_DAD_2	334	2.04	.973	111	24.9	28	0
PBI_DAD_3	334	.79	.781	111	24.9	0	11
PBI_DAD_4	334	2.28	.889	111	24.9	17	0
PBI_DAD_5	334	1.43	.943	111	24.9	0	0
PBI_DAD_6	334	.90	.923	111	24.9	0	26
PBI_DAD_7	334	.70	.812	111	24.9	0	15
PBI_DAD_8	334	2.17	.883	111	24.9	22	0
PBI_DAD_9	334	2.27	.860	111	24.9	19	0
PBI_DAD_10	334	2.40	.832	111	24.9	13	0
PBI_DAD_11	334	1.26	1.015	111	24.9	0	0
PBI_DAD_12	334	.94	.989	111	24.9	0	29
PBI_DAD_13	334	2.38	.817	111	24.9	12	0
PBI_DAD_14	334	1.76	.942	111	24.9	0	0
PBI_DAD_15	334	.79	.816	111	24.9	0	17
PBI_DAD_16	334	2.56	.806	111	24.9	13	0
PBI_DAD_17	334	1.28	.961	111	24.9	0	0
PBI_DAD_18	334	1.92	1.004	111	24.9	0	0

PBI_DAD_19	334	2.54	.720	111	24.9	33	0
PBI_DAD_20	334	2.54	.749	111	24.9	36	0
PBI_DAD_21	334	1.18	.881	111	24.9	0	28
PBI_DAD_22	334	1.25	.935	111	24.9	0	0
PBI_DAD_23	334	1.99	.923	111	24.9	26	0
PBI_DAD_24	334	2.23	.930	111	24.9	24	0
PBI_DAD_25	334	.93	.905	111	24.9	0	27
STYLE_A	349	4.41	1.755	96	21.6	0	0
STYLE_B	349	4.01	1.941	96	21.6	0	0
STYLE_C	349	3.48	1.929	96	21.6	0	0
STYLE_D	349	3.51	1.793	96	21.6	0	0
B1	339	3.29	.680	106	23.8	7	0
B2	339	3.20	.856	106	23.8	15	0
B3	339	2.67	.763	106	23.8	21	0
B4	339	3.58	.572	106	23.8	14	0
B5	339	3.37	.682	106	23.8	37	0
B6	339	3.02	.860	106	23.8	17	0
B7	339	3.52	.582	106	23.8	13	0
B8	339	3.06	.828	106	23.8	17	0
B9	339	2.60	.821	106	23.8	0	0
B10	339	2.95	.775	106	23.8	11	0
B11	339	2.68	.924	106	23.8	0	0
B12	339	2.60	.780	106	23.8	22	0
B13	339	3.32	.779	106	23.8	9	0
B14	339	3.05	.744	106	23.8	7	0
B15	339	2.72	.874	106	23.8	0	0
B16	339	3.04	.886	106	23.8	19	0
B17	339	3.43	.728	106	23.8	7	0
B18	339	3.37	.622	106	23.8	22	0
B19	339	3.51	.694	106	23.8	29	0
B20	339	2.92	.808	106	23.8	10	0
B21	339	2.22	.785	106	23.8	0	20
B22	339	2.68	.888	106	23.8	0	0
B23	339	3.25	.785	106	23.8	10	0
B24	339	3.22	.790	106	23.8	10	0
SSS_1	337	1.71	.838	108	24.3	0	14
SSS_2	337	2.19	1.070	108	24.3	0	7
SSS_3	337	2.99	1.152	108	24.3	0	0
SSS_4	337	2.77	1.344	108	24.3	0	0
SSS_5	337	2.69	1.383	108	24.3	0	0
SSS_6	337	2.81	1.024	108	24.3	0	17
SSS_7	337	2.96	1.415	108	24.3	0	0
SSS_8	337	3.22	1.196	108	24.3	0	0
BHS1	336	.14	.344	109	24.5	0	46
BHS2	336	.07	.253	109	24.5	0	23
BHS3	336	.24	.430	109	24.5	0	0
BHS4	336	.36	.481	109	24.5	0	0
BHS5	336	.32	.468	109	24.5	0	0

BHS6	336	.18	.381	109	24.5	0	59
BHS7	336	.13	.331	109	24.5	0	42
BHS8	336	.42	.495	109	24.5	0	0
BHS9	336	.17	.376	109	24.5	0	57
BHS10	336	.21	.411	109	24.5	0	0
BHS11	336	.07	.248	109	24.5	0	22
BHS12	336	.35	.476	109	24.5	0	0
BHS13	336	.27	.445	109	24.5	0	0
BHS14	336	.31	.463	109	24.5	0	0
BHS15	336	.32	.465	109	24.5	0	0
BHS16	336	.07	.263	109	24.5	0	25
BHS17	336	.11	.310	109	24.5	0	36
BHS18	336	.59	.493	109	24.5	0	0
BHS19	336	.11	.314	109	24.5	0	37
BHS20	336	.10	.306	109	24.5	0	35
HADS1	333	1.35	.771	112	25.2	0	29
HADS2	333	.59	.700	112	25.2	0	29
HADS3	333	1.25	1.010	112	25.2	0	0
HADS4	333	.29	.532	112	25.2	0	11
HADS5	333	1.46	.967	112	25.2	0	0
HADS6	333	.59	.665	112	25.2	0	25
HADS7	333	1.29	.852	112	25.2	0	17
HADS8	333	.98	.750	112	25.2	0	16
HADS9	333	.69	.844	112	25.2	0	11
HADS10	333	1.35	.860	112	25.2	0	0
HADS11	333	.46	.700	112	25.2	0	28
HADS12	333	.44	.741	112	25.2	0	28
HADS13	333	.96	.795	112	25.2	0	13
HADS14	333	1.04	.872	112	25.2	0	17
AC_1	334	3.62	1.058	111	24.9	11	0
AC_2	334	4.02	.745	111	24.9	8	0
AC_3	334	3.71	.927	111	24.9	6	0
AC_4	334	3.58	1.064	111	24.9	8	0
AC_5	334	2.69	1.486	111	24.9	0	0
AC_6	334	3.19	.967	111	24.9	14	0
AC_7	334	2.74	1.372	111	24.9	0	0
AC_8	334	1.97	1.029	111	24.9	0	9
AC_9	334	2.97	1.273	111	24.9	0	0
AC_10	334	2.15	1.072	111	24.9	0	6
AC_11	334	2.51	1.073	111	24.9	0	11
AC_12	334	3.13	1.153	111	24.9	0	0
AC_13	334	3.10	1.122	111	24.9	0	0
AC_14	334	2.07	1.337	111	24.9	0	27
AC_15	334	3.12	1.068	111	24.9	0	0
AC_16	334	1.78	1.006	111	24.9	0	24
AC_17	334	3.24	1.046	111	24.9	19	0
AC_18	334	3.09	1.122	111	24.9	0	0

a Number of cases outside the range (Mean - 2*SD, Mean + 2*SD).

Appendix H: Statistical Analysis

Table 14: Spearman's rank inter-correlations between factors in male self-harmers (merged samples)

	CARE_MUM	OVERPROTECT_MUM	CARE_DAD	OVERPROTECT_DAD	BIS_TOTAL	BAS_TOTAL	BASDRIVE	BASFUN	BASREWARD	SS_TOTAL	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
CARE_MUM	1.000	0.052	-0.059	-0.285	-0.014	-0.309	0.008	-0.273	**-.435(*)**	0.330	0.368	0.134	0.375	-0.010	-0.119	-0.160
	.	0.815	0.790	0.187	0.950	0.151	0.973	0.208	0.038	0.125	0.084	0.543	0.078	0.963	0.589	0.464
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
OVERPROTECT_MUM	0.052	1.000	0.138	0.318	-0.237	0.338	0.263	0.269	0.371	-0.142	-0.040	0.274	0.048	0.124	-0.194	-0.123
	0.815	.	0.529	0.139	0.277	0.115	0.226	0.214	0.081	0.519	0.857	0.205	0.828	0.573	0.376	0.577
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
CARE_DAD	-0.059	0.138	1.000	0.400	-0.161	-0.171	-0.010	-0.228	-0.207	0.051	-0.065	-0.041	0.122	0.050	-0.103	-0.245
	0.790	0.529	.	0.059	0.462	0.436	0.963	0.294	0.344	0.816	0.768	0.853	0.581	0.821	0.641	0.260
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
OVERPROTECT_DAD	-0.285	0.318	0.400	1.000	-0.153	0.042	-0.071	0.013	0.239	-0.195	0.015	0.273	-0.101	-0.015	-0.209	-0.178
	0.187	0.139	0.059	.	0.487	0.851	0.749	0.954	0.272	0.373	0.946	0.208	0.646	0.945	0.337	0.416
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BIS_TOTAL	-0.014	-0.237	-0.161	-0.153	1.000	**-.432(*)**	-0.399	**-.534(**)**	-0.136	**.436(*)**	0.361	0.360	0.358	**.443(*)**	0.385	-0.157
	0.950	0.277	0.462	0.487	.	0.039	0.060	0.009	0.535	0.038	0.090	0.092	0.094	0.034	0.070	0.476
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BAS_TOTAL	-0.309	0.338	-0.171	0.042	**-.432(*)**	1.000	**.869(**)**	**.844(**)**	**.736(**)**	-0.352	**-.474(*)**	-0.180	**-.597(**)**	-0.353	-0.213	0.200
	0.151	0.115	0.436	0.851	0.039	.	0.000	0.000	0.000	0.100	0.022	0.410	0.003	0.099	0.328	0.360
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BASDRIVE	0.008	0.263	-0.010	-0.071	-0.399	**.869(**)**	1.000	**.669(**)**	**.472(*)**	-0.137	-0.387	-0.285	**-.526(*)**	-0.297	-0.094	0.164
	0.973	0.226	0.963	0.749	0.060	0.000	.	0.000	0.023	0.534	0.068	0.187	0.010	0.169	0.670	0.455
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BASFUN	-0.273	0.269	-0.228	0.013	**-.534(**)**	**.844(**)**	**.669(**)**	1.000	0.398	**-.481(*)**	-0.381	-0.138	**-.601(**)**	**-.469(*)**	-0.176	0.194
	0.208	0.214	0.294	0.954	0.009	0.000	0.000	.	0.060	0.020	0.073	0.531	0.002	0.024	0.422	0.376
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BASREWARD	**-.435(*)**	0.371	-0.207	0.239	-0.136	**.736(**)**	.472(*)	0.398	1.000	-0.179	-0.306	-0.032	-0.309	0.004	-0.240	0.070
	0.038	0.081	0.344	0.272	0.535	0.000	0.023	0.060	.	0.413	0.155	0.884	0.151	0.986	0.269	0.750
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
SS_TOTAL	0.330	-0.142	0.051	-0.195	**.436(*)**	-0.352	-0.137	**-.481(*)**	-0.179	1.000	0.120	-0.144	0.249	0.308	0.326	-0.260
	0.125	0.519	0.816	0.373	0.038	0.100	0.534	0.020	0.413	.	0.584	0.513	0.253	0.153	0.129	0.231
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BHSTOTAL	0.368	-0.040	-0.065	0.015	0.361	**-.474(*)**	-0.387	-0.381	-0.306	0.120	1.000	**.437(*)**	**.660(**)**	**.601(**)**	0.041	-0.067
	0.084	0.857	0.768	0.946	0.090	0.022	0.068	0.073	0.155	0.584	.	0.037	0.001	0.002	0.852	0.761
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
HADSA_2	0.134	0.274	-0.041	0.273	0.360	-0.180	-0.285	-0.138	-0.032	-0.144	**.437(*)**	1.000	0.307	0.108	-0.354	-0.259
	0.543	0.205	0.853	0.208	0.092	0.410	0.187	0.531	0.884	0.513	0.037	.	0.154	0.625	0.097	0.232
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
HADSD_2	0.375	0.048	0.122	-0.101	0.358	**-.597(**)**	**-.526(*)**	**-.601(**)**	-0.309	0.249	**.660(**)**	0.307	1.000	**.500(*)**	-0.130	-0.021
	0.078	0.828	0.581	0.646	0.094	0.003	0.010	0.002	0.151	0.253	0.001	0.154	.	0.015	0.554	0.923
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
SP_ADJUSTED	-0.010	0.124	0.050	-0.015	**.443(*)**	-0.353	-0.297	**-.469(*)**	0.004	0.308	**.601(**)**	0.108	**.500(*)**	1.000	**.444(*)**	-0.028
	0.963	0.573	0.821	0.945	0.034	0.099	0.169	0.024	0.986	0.153	0.002	0.625	0.015	.	0.034	0.899
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
RO_ADJUSTED	-0.119	-0.194	-0.103	-0.209	0.385	-0.213	-0.094	-0.176	-0.240	0.326	0.041	-0.354	-0.130	**.444(*)**	1.000	0.046
	0.589	0.376	0.641	0.337	0.070	0.328	0.670	0.422	0.269	0.129	0.852	0.097	0.554	0.034	.	0.836
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
NPC_ADJUSTED	-0.160	-0.123	-0.245	-0.178	-0.157	0.200	0.164	0.194	0.070	-0.260	-0.067	-0.259	-0.021	-0.028	0.046	1.000
	0.464	0.577	0.260	0.416	0.476	0.360	0.455	0.376	0.750	0.231	0.761	0.232	0.923	0.899	0.836	.
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23

Table 15: Spearman's rank inter-correlations between factors in female self-harmers (merged samples)

	CARE_MUM	OVERPROTECT_MUM	CARE_DAD	OVERPROTECT_DAD	BIS_TOTAL	BAS_TOTAL	BASDRIVE	BASFUN	BASREWARD	SS_TOTAL	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
CARE_MUM	1.000	.223(*)	.255(*)	.282(**)	0.155	-0.057	-0.086	-0.015	-0.011	-0.064	-0.080	0.145	0.003	-0.171	-0.137	0.062
		0.027	0.011	0.005	0.128	0.579	0.399	0.881	0.918	0.533	0.431	0.155	0.979	0.092	0.179	0.542
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
OVERPROTECT_MUM	.223(*)	1.000	0.132	.233(*)	0.019	-.220(*)	-.204(*)	-0.160	-0.150	0.038	-0.120	-0.129	0.000	-0.074	0.135	0.072
	0.027		0.195	0.021	0.850	0.029	0.044	0.116	0.141	0.707	0.238	0.207	0.997	0.468	0.186	0.479
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
CARE_DAD	.255(*)	0.132	1.000	0.106	0.046	-0.035	0.054	-0.036	-0.137	-0.046	-0.021	0.051	-0.055	-0.178	-0.118	0.164
	0.011	0.195		0.300	0.653	0.736	0.595	0.722	0.179	0.651	0.835	0.620	0.593	0.079	0.248	0.107
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
OVERPROTECT_DAD	.282(**)	.233(*)	0.106	1.000	-0.031	-0.099	-0.115	-0.084	-0.033	-0.068	-0.019	-0.099	-0.085	-0.026	-0.172	-0.088
	0.005	0.021	0.300		0.759	0.330	0.259	0.412	0.750	0.508	0.856	0.333	0.406	0.802	0.091	0.391
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BIS_TOTAL	0.155	0.019	0.046	-0.031	1.000	-0.103	-0.108	-0.120	-0.009	0.016	0.007	.351(**)	0.142	-0.187	0.109	0.005
	0.128	0.850	0.653	0.759		0.313	0.289	0.238	0.931	0.879	0.944	0.000	0.163	0.065	0.285	0.965
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BAS_TOTAL	-0.057	-.220(*)	-0.035	-0.099	-0.103	1.000	.742(**)	.847(**)	.745(**)	-.419(**)	-0.161	-0.143	-.262(**)	0.152	-0.080	-0.187
	0.579	0.029	0.736	0.330	0.313		0.000	0.000	0.000	0.000	0.114	0.160	0.009	0.134	0.431	0.066
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BASDRIVE	-0.086	-.204(*)	0.054	-0.115	-0.108	.742(**)	1.000	.464(**)	.349(**)	-.253(*)	-0.132	-0.079	-0.128	0.103	-0.077	-.308(**)
	0.399	0.044	0.595	0.259	0.289	0.000		0.000	0.000	0.012	0.196	0.437	0.210	0.311	0.448	0.002
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BASFUN	-0.015	-0.160	-0.036	-0.084	-0.120	.847(**)	.464(**)	1.000	.471(**)	-.499(**)	-0.130	-.209(*)	-.295(**)	0.155	0.011	-0.058
	0.881	0.116	0.722	0.412	0.238	0.000	0.000		0.000	0.000	0.201	0.039	0.003	0.128	0.913	0.567
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BASREWARD	-0.011	-0.150	-0.137	-0.033	-0.009	.745(**)	.349(**)	.471(**)	1.000	-.261(**)	-0.151	-0.041	-0.197	0.110	-0.111	-0.107
	0.918	0.141	0.179	0.750	0.931	0.000	0.000	0.000		0.009	0.138	0.691	0.052	0.282	0.276	0.295
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
SS_TOTAL	-0.064	0.038	-0.046	-0.068	0.016	-.419(**)	-.253(*)	-.499(**)	-.261(**)	1.000	0.038	0.100	.248(*)	-0.143	-0.092	0.123
	0.533	0.707	0.651	0.508	0.879	0.000	0.012	0.000	0.009		0.708	0.329	0.014	0.160	0.368	0.226
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BHSTOTAL	-0.080	-0.120	-0.021	-0.019	0.007	-0.161	-0.132	-0.130	-0.151	0.038	1.000	.355(**)	.429(**)	0.151	-0.078	0.142
	0.431	0.238	0.835	0.856	0.944	0.114	0.196	0.201	0.138	0.708		0.000	0.000	0.139	0.447	0.163
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
HADSA_2	0.145	-0.129	0.051	-0.099	.351(**)	-0.143	-0.079	-.209(*)	-0.041	0.100	.355(**)	1.000	.401(**)	-0.122	-0.016	0.040
	0.155	0.207	0.620	0.333	0.000	0.160	0.437	0.039	0.691	0.329	0.000		0.000	0.230	0.876	0.695
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
HADSD_2	0.003	0.000	-0.055	-0.085	0.142	-.262(**)	-0.128	-.295(**)	-0.197	.248(*)	.429(**)	.401(**)	1.000	-0.011	0.027	0.122
	0.979	0.997	0.593	0.406	0.163	0.009	0.210	0.003	0.052	0.014	0.000	0.000		0.913	0.789	0.230
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
SP_ADJUSTED	-0.171	-0.074	-0.178	-0.026	-0.187	0.152	0.103	0.155	0.110	-0.143	0.151	-0.122	-0.011	1.000	0.124	-0.107
	0.092	0.468	0.079	0.802	0.065	0.134	0.311	0.128	0.282	0.160	0.139	0.230	0.913		0.225	0.294
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
RO_ADJUSTED	-0.137	0.135	-0.118	-0.172	0.109	-0.080	-0.077	0.011	-0.111	-0.092	-0.078	-0.016	0.027	0.124	1.000	0.075
	0.179	0.186	0.248	0.091	0.285	0.431	0.448	0.913	0.276	0.368	0.447	0.876	0.789	0.225		0.464
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
NPC_ADJUSTED	0.062	0.072	0.164	-0.088	0.005	-0.187	-.308(**)	-0.058	-0.107	0.123	0.142	0.040	0.122	-0.107	0.075	1.000
	0.542	0.479	0.107	0.391	0.965	0.066	0.002	0.567	0.295	0.226	0.163	0.695	0.230	0.294	0.464	
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98

Table 16: Spearman's rank inter-correlations between factors in male self-harmers (school sample)

	CARE_MUM	OVERPROTECT_MUM	CARE_DAD	OVERPROTECT_DAD	BIS_TOTAL	BAS_Total	BASDRIVE	BASFUN	BASREWARD	SS_TOTAL	EXPERIENCE	BOREDOM	THRILL_ADVENTURE	DISINHIBITION	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
CARE_MUM	1.000	-0.265	**.719(**)**	-0.344	-0.276	-0.168	-0.425	-0.015	-0.077	0.148	0.074	0.176	-0.187	0.391	-0.155	**-.736(**)**	-0.487	0.389	-0.021	-0.352
		0.322	0.003	0.210	0.300	0.533	0.101	0.956	0.776	0.585	0.787	0.516	0.489	0.134	0.566	0.001	0.056	0.137	0.939	0.181
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
OVERPROTECT_MUM	-0.265	1.000	-0.158	0.155	0.366	-0.106	0.027	-0.111	-0.218	0.204	0.253	0.391	-0.025	-0.007	0.312	0.074	0.168	-0.468	0.016	-0.065
	0.322		0.573	0.581	0.163	0.696	0.922	0.682	0.417	0.448	0.345	0.134	0.925	0.978	0.239	0.785	0.534	0.068	0.952	0.811
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
CARE_DAD	**.719(**)**	-0.158	1.000	**-.752(**)**	-0.085	-0.045	-0.244	-0.127	0.092	0.113	-0.280	0.236	-0.198	0.364	-0.201	**-.642(**)**	**-.622(*)**	0.202	0.073	-0.309
	0.003	0.573		0.001	0.763	0.874	0.381	0.652	0.744	0.688	0.312	0.397	0.479	0.182	0.473	0.010	0.013	0.471	0.796	0.263
	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
OVERPROTECT_DAD	-0.344	0.155	**-.752(**)**	1.000	-0.172	0.319	0.373	0.321	0.243	-0.373	0.162	-0.308	-0.254	-0.485	-0.068	0.222	0.393	0.018	0.096	-0.065
	0.210	0.581	0.001		0.539	0.247	0.170	0.244	0.383	0.171	0.565	0.263	0.361	0.067	0.811	0.426	0.148	0.949	0.734	0.817
	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
BIS_TOTAL	-0.276	0.366	-0.085	-0.172	1.000	0.127	0.122	0.062	0.045	-0.071	-0.264	0.040	0.180	-0.033	0.222	0.401	0.395	**-.516(*)**	0.167	0.216
	0.300	0.163	0.763	0.539		0.639	0.653	0.820	0.869	0.794	0.324	0.883	0.505	0.904	0.408	0.124	0.130	0.041	0.538	0.422
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
BAS_Total	-0.168	-0.106	-0.045	0.319	0.127	1.000	**.735(**)**	**.832(**)**	**.904(**)**	-0.370	-0.334	-0.086	-0.213	-0.379	**-.751(**)**	-0.105	-0.160	0.382	**.665(**)**	-0.186
	0.533	0.696	0.874	0.247	0.639		0.001	0.000	0.000	0.158	0.206	0.752	0.428	0.148	0.001	0.700	0.554	0.144	0.005	0.491
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
BASDRIVE	-0.425	0.027	-0.244	0.373	0.122	**.735(**)**	1.000	0.385	**.575(*)**	-0.376	-0.316	-0.139	-0.392	-0.370	-0.458	0.319	0.026	0.288	**.680(**)**	-0.294
	0.101	0.922	0.381	0.170	0.653	0.001		0.141	0.020	0.151	0.233	0.609	0.133	0.159	0.075	0.229	0.924	0.280	0.004	0.269
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
BASFUN	-0.015	-0.111	-0.127	0.321	0.062	**.832(**)**	0.385	1.000	**.665(**)**	-0.185	-0.148	0.013	0.061	-0.188	**-.589(*)**	-0.246	-0.123	0.426	0.496	-0.013
	0.956	0.682	0.652	0.244	0.820	0.000	0.141		0.005	0.494	0.585	0.962	0.822	0.485	0.016	0.358	0.649	0.100	0.051	0.963
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
BASREWARD	-0.077	-0.218	0.092	0.243	0.045	**.904(**)**	**.575(*)**	**.665(**)**	1.000	-0.345	-0.311	-0.131	-0.240	-0.347	**-.757(**)**	-0.153	-0.233	0.339	0.416	-0.074
	0.776	0.417	0.744	0.383	0.869	0.000	0.020	0.005		0.191	0.241	0.629	0.371	0.187	0.001	0.572	0.385	0.199	0.109	0.786
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
SS_TOTAL	0.148	0.204	0.113	-0.373	-0.071	-0.370	-0.376	-0.185	-0.345	1.000	**.801(**)**	**.796(**)**	**.582(*)**	**.721(**)**	0.107	0.013	-0.383	0.142	-0.263	0.097
	0.585	0.448	0.688	0.171	0.794	0.158	0.151	0.494	0.191		0.000	0.000	0.018	0.002	0.694	0.962	0.143	0.600	0.324	0.721
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
EXPERIENCE	0.074	0.253	-0.280	0.162	-0.264	-0.334	-0.316	-0.148	-0.311	**.801(**)**	1.000	**.552(*)**	0.431	0.343	0.048	-0.048	-0.277	0.125	-0.278	0.005
	0.787	0.345	0.312	0.565	0.324	0.206	0.233	0.585	0.241	0.000		0.027	0.095	0.194	0.858	0.861	0.298	0.645	0.297	0.986
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
BOREDOM	0.176	0.391	0.236	-0.308	0.040	-0.086	-0.139	0.013	-0.131	**.796(**)**	**.552(*)**	1.000	0.265	**.568(*)**	0.046	-0.106	-0.406	0.111	-0.111	0.078
	0.516	0.134	0.397	0.263	0.883	0.752	0.609	0.962	0.629	0.000	0.027		0.321	0.022	0.866	0.696	0.119	0.681	0.684	0.773
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
THRILL_ADVENTURE	-0.187	-0.025	-0.198	-0.254	0.180	-0.213	-0.392	0.061	-0.240	**.582(*)**	0.431	0.265	1.000	0.199	0.093	0.178	-0.066	-0.154	-0.142	0.455
	0.489	0.925	0.479	0.361	0.505	0.428	0.133	0.822	0.371	0.018	0.095	0.321		0.460	0.733	**0.510**	0.809	0.570	0.601	0.076
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
DISINHIBITION	0.391	-0.007	0.364	-0.485	-0.033	-0.379	-0.370	-0.188	-0.347	**.721(**)**	0.343	**.568(*)**	0.199	1.000	0.213	-0.030	-0.183	0.213	-0.266	-0.072
	0.134	0.978	0.182	0.067	0.904	0.148	0.159	0.485	0.187	0.002	0.194	0.022	0.460		0.428	0.911	0.497	0.429	0.320	0.792
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
BHSTOTAL	-0.155	0.312	-0.201	-0.068	0.222	**-.751(**)**	-0.458	**-.589(*)**	**-.757(**)**	0.107	0.048	0.046	0.093	0.213	1.000	0.277	**.565(*)**	**-.667(**)**	**-.597(*)**	0.326
	0.566	0.239	0.473	0.811	0.408	0.001	0.075	0.016	0.001	0.694	0.858	0.866	0.733	0.428		0.299	0.022	0.005	0.015	0.218
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
HADSA_2	**-.736(**)**	0.074	**-.642(**)**	0.222	0.401	-0.105	0.319	-0.246	-0.153	0.013	-0.048	-0.106	0.178	-0.030	0.277	1.000	0.482	-0.268	-0.120	0.442
	0.001	0.785	0.010	0.426	0.124	0.700	0.229	0.358	0.572	0.962	0.861	0.696	0.510	0.911	0.299		0.059	0.316	0.658	0.086
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
HADSD_2	-0.487	0.168	**-.622(*)**	0.393	0.395	-0.160	0.026	-0.123	-0.233	-0.383	-0.277	-0.406	-0.066	-0.183	**.565(*)**	0.482	1.000	**-.545(*)**	-0.097	0.222
	0.056	0.534	0.013	0.148	0.130	0.554	0.924	0.649	0.385	0.143	0.298	0.119	0.809	0.497	0.022	0.059		0.029	0.722	0.409
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
SP_ADJUSTED	0.389	-0.468	0.202	0.018	**-.516(*)**	0.382	0.288	0.426	0.339	0.142	0.125	0.111	-0.154	0.213	**-.667(**)**	-0.268	**-.545(*)**	1.000	0.392	-0.273
	0.137	0.068	0.471	0.949	0.041	0.144	0.280	0.100	0.199	0.600	0.645	0.681	0.570	0.429	0.005	0.316	0.029		0.133	0.307
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
RO_ADJUSTED	-0.021	0.016	0.073	0.096	0.167	**.665(**)**	**.680(**)**	0.496	0.416	-0.263	-0.278	-0.111	-0.142	-0.266	**-.597(*)**	-0.120	-0.097	0.392	1.000	**-.585(*)**
	0.939	0.952	0.796	0.734	0.538	0.005	0.004	0.051	0.109	0.324	0.297	0.684	0.601	0.320	0.015	0.658	0.722	0.133		0.017
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
NPC_ADJUSTED	-0.352	-0.065	-0.309	-0.065	0.216	-0.186	-0.294	-0.013	-0.074	0.097	0.005	0.078	0.455	-0.072	0.326	0.442	0.222	-0.273	**-.585(*)**	1.000
	0.181	0.811	0.263	0.817	0.422	0.491	0.269	0.963	0.786	0.721	0.986	0.773	0.076	0.792	0.218	0.086	0.409	0.307	0.017	
	16	16	15	15	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16

Table 17: Spearman's rank inter-correlations between factors in female self-harmers (school sample)

	CARE_MUM	OVERPROTECT_MUM	CARE_DAD	OVERPROTECT_DAD	BIS_TOTAL	BAS_Total	BASDRIVE	BASFUN	BASREWARD	SS_TOTAL	EXPERIENCE	BOREDOM	THRILL_ADVENTURE	DISINHIBITION	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
CARE_MUM	1.000	**-.656(**)**	**.503(**)**	**-.582(**)**	**-.358(*)**	0.074	-0.144	0.201	0.127	0.136	0.009	0.067	0.110	0.222	**-.331(*)**	-0.244	**-.519(**)**	**.315(*)**	0.167	-0.265
		0.000	0.001	0.000	0.022	0.644	0.368	0.209	0.430	0.398	0.953	0.678	0.493	0.163	0.035	0.125	0.001	0.045	0.297	0.095
	41	41	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
OVERPROTECT_MUM	**-.656(**)**	1.000	-0.225	**.577(**)**	0.272	0.020	0.082	-0.066	0.036	-0.039	0.032	0.063	-0.104	-0.124	0.188	0.225	**.334(*)**	-0.009	0.125	0.292
	0.000		0.163	0.000	0.085	0.900	0.609	0.681	0.823	0.809	0.841	0.694	0.518	0.442	0.240	0.158	0.033	0.955	0.436	0.064
	41	41	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
CARE_DAD	**.503(**)**	-0.225	1.000	**-.575(**)**	-0.144	**.468(**)**	0.137	**.428(**)**	**.456(**)**	-0.222	-0.138	-0.092	-0.101	-0.153	**-.396(*)**	-0.256	-0.291	**.353(*)**	0.142	-0.112
	0.001	0.163		0.000	0.370	0.002	0.395	0.005	0.003	0.163	0.388	0.567	0.529	0.340	0.010	0.107	0.065	0.024	0.375	0.484
	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
OVERPROTECT_DAD	**-.582(**)**	**.577(**)**	**-.575(**)**	1.000	0.299	-0.158	0.031	-0.213	-0.084	0.103	0.009	0.101	0.094	0.029	0.236	**.376(*)**	**.419(**)**	-0.171	-0.134	0.277
	0.000	0.000	0.000		0.057	0.324	0.845	0.181	0.600	0.522	0.956	0.530	0.557	0.859	0.137	0.015	0.006	0.286	0.404	0.080
	40	40	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
BIS_TOTAL	**-.358(*)**	0.272	-0.144	0.299	1.000	0.093	0.148	-0.044	0.156	0.120	0.080	0.029	0.214	-0.085	**.339(*)**	**.490(**)**	0.189	-0.119	0.104	**.456(**)**
	0.022	0.085	0.370	0.057		0.556	0.349	0.781	0.323	0.450	0.615	0.853	0.174	0.594	0.028	0.001	0.231	0.452	0.511	0.002
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
BAS_Total	0.074	0.020	**.468(**)**	-0.158	0.093	1.000	**.713(**)**	**.729(**)**	**.767(**)**	**-.505(**)**	-0.156	-0.303	-0.290	**-.659(**)**	**-.386(*)**	-0.015	-0.172	-0.017	0.025	0.071
	0.644	0.900	0.002	0.324	0.556		0.000	0.000	0.000	0.001	0.325	0.051	0.063	0.000	0.017	0.924	0.275	0.916	0.874	0.656
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
BASDRIVE	-0.144	0.082	0.137	0.031	0.148	**.713(**)**	1.000	**.316(*)**	**.341(*)**	**-.305(*)**	-0.009	-0.029	-0.153	**-.585(**)**	-0.115	-0.121	0.050	-0.116	-0.175	0.240
	0.368	0.609	0.395	0.845	0.349	0.000		0.041	0.027	0.049	0.956	0.853	0.332	0.000	0.469	0.445	0.753	0.464	0.269	0.126
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
BASFUN	0.201	-0.066	**.428(**)**	-0.213	-0.044	**.729(**)**	**.316(*)**	1.000	**.361(*)**	**-.575(**)**	**-.325(*)**	**-.447(**)**	**-.379(*)**	**-.540(**)**	**-.392(*)**	-0.133	**-.330(*)**	0.195	0.050	-0.113
	0.209	0.681	0.005	0.181	0.781	0.000	0.041		0.019	0.000	0.036	0.003	0.013	0.000	0.010	0.401	0.033	0.215	0.754	0.478
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
BASREWARD	0.127	0.036	**.456(**)**	-0.084	0.156	**.767(**)**	**.341(*)**	**.361(*)**	1.000	-0.290	-0.093	-0.249	-0.142	**-.327(*)**	**-.345(*)**	0.241	-0.091	-0.059	0.166	0.055
	0.430	0.823	0.003	0.600	0.323	0.000	0.027	0.019		0.062	0.557	0.112	0.370	0.034	0.025	0.124	0.566	0.710	0.293	0.731
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
SS_TOTAL	0.136	-0.039	-0.222	0.103	0.120	**-.505(**)**	**-.305(*)**	**-.575(**)**	-0.290	1.000	**.702(**)**	**.619(**)**	**.799(**)**	**.705(**)**	0.156	0.032	0.031	0.076	0.075	-0.025
	0.398	0.809	0.163	0.522	0.450	0.001	0.049	0.000	0.062		0.000	0.000	0.000	0.000	0.325	0.842	0.844	0.630	0.635	0.875
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
EXPERIENCE	0.009	0.032	-0.138	0.009	0.080	-0.156	-0.009	**-.325(*)**	-0.093	**.702(**)**	1.000	**.489(**)**	**.459(**)**	0.243	0.282	-0.009	0.190	-0.228	-0.110	-0.088
	0.953	0.841	0.388	0.956	0.615	0.325	0.956	0.036	0.557	0.000		0.001	0.002	0.121	0.070	0.956	0.228	0.147	0.490	0.578
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
BOREDOM	0.067	0.063	-0.092	0.101	0.029	-0.303	-0.029	**-.447(**)**	-0.249	**.619(**)**	**.489(**)**	1.000	**.357(*)**	0.245	0.224	0.004	0.173	0.030	-0.096	0.078
	0.678	0.694	0.567	0.530	0.853	0.051	0.853	0.003	0.112	0.000	0.001		0.020	0.118	0.154	0.979	0.273	0.850	0.543	0.621
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
THRILL_ADVENTURE	0.110	-0.104	-0.101	0.094	0.214	-0.290	-0.153	**-.379(*)**	-0.142	**.799(**)**	**.459(**)**	**.357(*)**	1.000	**.418(**)**	-0.014	-0.120	-0.113	0.103	0.162	0.053
	0.493	0.518	0.529	0.557	0.174	0.063	0.332	0.013	0.370	0.000	0.002	0.020		0.006	0.929	0.448	0.477	0.515	0.306	0.739
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
DISINHIBITION	0.222	-0.124	-0.153	0.029	-0.085	**-.659(**)**	**-.585(**)**	**-.540(**)**	**-.327(*)**	**.705(**)**	0.243	0.245	**.418(**)**	1.000	0.112	0.102	0.032	0.123	0.041	-0.097
	0.163	0.442	0.340	0.859	0.594	0.000	0.000	0.000	0.034	0.000	0.121	0.118	0.006		0.480	0.519	0.843	0.438	0.796	0.540
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
BHSTOTAL	**-.331(*)**	0.188	**-.396(*)**	0.236	**.339(*)**	**-.366(*)**	-0.115	**-.392(*)**	**-.345(*)**	0.156	0.282	0.224	-0.014	0.112	1.000	**.386(*)**	**.530(**)**	**-.506(**)**	**-.308(*)**	0.182
	0.035	0.240	0.010	0.137	0.028	0.017	0.469	0.010	0.025	0.325	0.070	0.154	0.929	0.480		0.012	0.000	0.001	0.047	0.248
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
HADSA_2	-0.244	0.225	-0.256	**.376(*)**	**.490(**)**	-0.015	-0.121	-0.133	0.241	0.032	-0.009	0.004	-0.120	0.102	**.386(*)**	1.000	0.195	-0.143	-0.039	**.340(*)**
	0.125	0.158	0.107	0.015	0.001	0.924	0.445	0.401	0.124	0.842	0.956	0.979	0.448	0.519	0.012		0.217	0.366	0.804	0.028
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
HADSD_2	**-.519(**)**	**.334(*)**	-0.291	**.419(**)**	0.189	-0.172	0.050	**-.330(*)**	-0.091	0.031	0.190	0.173	-0.113	0.032	**.530(**)**	0.195	1.000	**-.568(**)**	-0.262	0.085
	0.001	0.033	0.065	0.006	0.231	0.275	0.753	0.033	0.566	0.844	0.226	0.273	0.477	0.843	0.000	0.217		0.000	0.094	0.592
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
SP_ADJUSTED	**.315(*)**	-0.009	**.353(*)**	-0.171	-0.119	-0.017	-0.116	0.195	-0.059	0.076	-0.228	0.030	0.103	0.123	**-.506(**)**	-0.143	**-.568(**)**	1.000	0.261	0.160
	0.045	0.955	0.024	0.286	0.452	0.916	0.464	0.215	0.710	0.630	0.147	0.850	0.515	0.438	0.001	0.366	0.000		0.096	0.312
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
RO_ADJUSTED	0.167	0.125	0.142	-0.134	0.104	0.025	-0.175	0.050	0.166	0.075	-0.110	-0.096	0.162	0.041	**-.308(*)**	-0.039	-0.262	0.261	1.000	-0.051
	0.297	0.436	0.375	0.404	0.511	0.874	0.269	0.754	0.293	0.635	0.490	0.543	0.306	0.796	0.047	0.804	0.094	0.096		0.747
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
NPC_ADJUSTED	-0.265	0.292	-0.112	0.277	**.456(**)**	0.071	0.240	-0.113	0.055	-0.025	-0.088	0.078	0.053	-0.097	0.182	.340(*)	0.085	0.160	-0.051	1.000
	0.095	0.064	0.484	0.080	0.002	0.656	0.126	0.478	0.731	0.875	0.578	0.621	0.739	0.540	0.248	0.028	0.592	0.312	0.747	
	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42

Table 18: Spearman's rank inter-correlations between factors in male self-harmers (college sample)

	CARE_MUM	OVERPROTECT_MUM	CARE_DAD	OVERPROTECT_DAD	BIS_TOTAL	BAS_TOTAL	BASDRIVE	BASFUN	BASREWARD	SS_TOTAL	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
CARE_MUM	1.000	0.052	-0.059	-0.285	-0.014	-0.309	0.008	-0.273	**-.435(*)**	0.330	0.368	0.134	0.375	-0.010	-0.119	-0.160
		0.815	0.790	0.187	0.950	0.151	0.973	0.208	0.038	0.125	0.084	0.543	0.078	0.963	0.589	0.464
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
OVERPROTECT_MUM	0.052	1.000	0.138	0.318	-0.237	0.338	0.263	0.269	0.371	-0.142	-0.040	0.274	0.048	0.124	-0.194	-0.123
	0.815		0.529	0.139	0.277	0.115	0.226	0.214	0.081	0.519	0.857	0.205	0.828	0.573	0.376	0.577
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
CARE_DAD	-0.059	0.138	1.000	0.400	-0.161	-0.171	-0.010	-0.228	-0.207	0.051	-0.065	-0.041	0.122	0.050	-0.103	-0.245
	0.790	0.529		0.059	0.462	0.436	0.963	0.294	0.344	0.816	0.768	0.853	0.581	0.821	0.641	0.260
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
OVERPROTECT_DAD	-0.285	0.318	0.400	1.000	-0.153	0.042	-0.071	0.013	0.239	-0.195	0.015	0.273	-0.101	-0.015	-0.209	-0.178
	0.187	0.139	0.059		0.487	0.851	0.749	0.954	0.272	0.373	0.946	0.208	0.646	0.945	0.337	0.416
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BIS_TOTAL	-0.014	-0.237	-0.161	-0.153	1.000	**-.432(*)**	-0.399	**-.534(**)**	-0.136	**.436(*)**	0.361	0.360	0.358	**.443(*)**	0.385	-0.157
	0.950	0.277	0.462	0.487		0.039	0.060	0.009	0.535	0.038	0.090	0.092	0.094	0.034	0.070	0.476
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BAS_TOTAL	-0.309	0.338	-0.171	0.042	**-.432(*)**	1.000	**.869(**)**	**.844(**)**	**.736(**)**	**-0.352**	**-.474(*)**	-0.180	**-.597(**)**	-0.353	-0.213	0.200
	0.151	0.115	0.436	0.851	0.039		0.000	0.000	0.000	0.100	0.022	0.410	0.003	0.099	0.328	0.360
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BASDRIVE	0.008	0.263	-0.010	-0.071	-0.399	**.869(**)**	1.000	**.669(**)**	**.472(*)**	-0.137	-0.387	-0.285	**-.526(*)**	-0.297	-0.094	0.164
	0.973	0.226	0.963	0.749	0.060	0.000		0.000	0.023	0.534	0.068	0.187	0.010	0.169	0.670	0.455
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BASFUN	-0.273	0.269	-0.228	0.013	**-.534(**)**	**.844(**)**	**.669(**)**	1.000	0.398	-.481(*)	-0.381	-0.138	**-.601(**)**	**-.469(*)**	-0.176	0.194
	0.208	0.214	0.294	0.954	0.009	0.000	0.000		0.060	0.020	0.073	0.531	0.002	0.024	0.422	0.376
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BASREWARD	**-.435(*)**	0.371	-0.207	0.239	-0.136	**.736(**)**	**.472(*)**	0.398	1.000	-0.179	-0.306	-0.032	-0.309	0.004	-0.240	0.070
	0.038	0.081	0.344	0.272	0.535	0.000	0.023	0.060		0.413	0.155	0.884	0.151	0.986	0.269	0.750
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
SS_TOTAL	0.330	-0.142	0.051	-0.195	**.436(*)**	-0.352	-0.137	**-.481(*)**	-0.179	1.000	0.120	-0.144	0.249	0.308	0.326	-0.260
	0.125	0.519	0.816	0.373	0.038	0.100	0.534	0.020	0.413		0.584	0.513	0.253	0.153	0.129	0.231
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
BHSTOTAL	0.368	-0.040	-0.065	0.015	0.361	**-.474(*)**	-0.387	-0.381	-0.306	0.120	1.000	**.437(*)**	**.660(**)**	**.601(**)**	0.041	-0.067
	0.084	0.857	0.768	0.946	0.090	0.022	0.068	0.073	0.155	0.584		0.037	0.001	0.002	0.852	0.761
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
HADSA_2	0.134	0.274	-0.041	0.273	0.360	-0.180	-0.285	-0.138	-0.032	-0.144	**.437(*)**	1.000	0.307	0.108	-0.354	-0.259
	0.543	0.205	0.853	0.208	0.092	0.410	0.187	0.531	0.884	0.513	0.037		0.154	0.625	0.097	0.232
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
HADSD_2	0.375	0.048	0.122	-0.101	0.358	**-.597(**)**	**-.526(*)**	**-.601(**)**	-0.309	0.249	**.660(**)**	0.307	1.000	**.500(*)**	-0.130	-0.021
	0.078	0.828	0.581	0.646	0.094	0.003	0.010	0.002	0.151	0.253	0.001	0.154		0.015	0.554	0.923
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
SP_ADJUSTED	-0.010	0.124	0.050	-0.015	**.443(*)**	-0.353	-0.297	**-.469(*)**	0.004	0.308	**.601(**)**	0.108	**.500(*)**	1.000	**.444(*)**	-0.028
	0.963	0.573	0.821	0.945	0.034	0.099	0.169	0.024	0.986	0.153	0.002	0.625	0.015		0.034	0.899
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
RO_ADJUSTED	-0.119	-0.194	-0.103	-0.209	0.385	-0.213	-0.094	-0.176	-0.240	0.326	0.041	-0.354	-0.130	**.444(*)**	1.000	0.046
	0.589	0.376	0.641	0.337	0.070	0.328	0.670	0.422	0.269	0.129	0.852	0.097	0.554	0.034		0.836
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
NPC_ADJUSTED	-0.160	-0.123	-0.245	-0.178	-0.157	0.200	0.164	0.194	0.070	-0.260	-0.067	-0.259	-0.021	-0.028	0.046	1.000
	0.464	0.577	0.260	0.416	0.476	0.360	0.455	0.376	0.750	0.231	0.761	0.232	0.923	0.899	0.836	
	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23

Table 19: Spearman's rank inter-correlations in female self-harmers (college sample)

	CARE_MUM	OVERPROTECT_MUM	CARE_DAD	OVERPROTECT_DAD	BIS_TOTAL	BAS_TOTAL	BASDRIVE	BASFUN	BASREWARD	SS_TOTAL	BHSTOTAL	HADSA_2	HADSD_2	SP_ADJUSTED	RO_ADJUSTED	NPC_ADJUSTED
CARE_MUM	1.000	.223(*)	.255(*)	.282(**)	0.155	-0.057	-0.086	-0.015	-0.011	-0.064	-0.080	0.145	0.003	-0.171	-0.137	0.062
	.	0.027	0.011	0.005	0.128	0.579	0.399	0.881	0.918	0.533	0.431	0.155	0.979	0.092	0.179	0.542
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
OVERPROTECT_MUM	.223(*)	1.000	0.132	.233(*)	0.019	-.220(*)	-.204(*)	-0.160	-0.150	0.038	-0.120	-0.129	0.000	-0.074	0.135	0.072
	0.027	.	0.195	0.021	0.850	0.029	0.044	0.116	0.141	0.707	0.238	0.207	0.997	0.468	0.186	0.479
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
CARE_DAD	.255(*)	0.132	1.000	0.106	0.046	-0.035	0.054	-0.036	-0.137	-0.046	-0.021	0.051	-0.055	-0.178	-0.118	0.164
	0.011	0.195	.	0.300	0.653	0.736	0.595	0.722	0.179	0.651	0.835	0.620	0.593	0.079	0.248	0.107
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
OVERPROTECT_DAD	.282(**)	.233(*)	0.106	1.000	-0.031	-0.099	-0.115	-0.084	-0.033	-0.068	-0.019	-0.099	-0.085	-0.026	-0.172	-0.088
	0.005	0.021	0.300	.	0.759	0.330	0.259	0.412	0.750	0.508	0.856	0.333	0.406	0.802	0.091	0.391
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BIS_TOTAL	0.155	0.019	0.046	-0.031	1.000	-0.103	-0.108	-0.120	-0.009	0.016	0.007	.351(**)	0.142	-0.187	0.109	0.005
	0.128	0.850	0.653	0.759	.	0.313	0.289	0.238	0.931	0.879	0.944	0.000	0.163	0.065	0.285	0.965
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BAS_TOTAL	-0.057	-.220(*)	-0.035	-0.099	-0.103	1.000	.742(**)	.847(**)	.745(**)	-.419(**)	-0.161	-0.143	-.262(**)	0.152	-0.080	-0.187
	0.579	0.029	0.736	0.330	0.313	.	0.000	0.000	0.000	0.000	0.114	0.160	0.009	0.134	0.431	0.066
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BASDRIVE	-0.086	-.204(*)	0.054	-0.115	-0.108	.742(**)	1.000	.464(**)	.349(**)	-.253(*)	-0.132	-0.079	-0.128	0.103	-0.077	-.308(**)
	0.399	0.044	0.595	0.259	0.289	0.000	.	0.000	0.000	0.012	0.196	0.437	0.210	0.311	0.448	0.002
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BASFUN	-0.015	-0.160	-0.036	-0.084	-0.120	.847(**)	.464(**)	1.000	.471(**)	-.499(**)	-0.130	-.209(*)	-.295(**)	0.155	0.011	-0.058
	0.881	0.116	0.722	0.412	0.238	0.000	0.000	.	0.000	0.000	0.201	0.039	0.003	0.128	0.913	0.567
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BASREWARD	-0.011	-0.150	-0.137	-0.033	-0.009	.745(**)	.349(**)	.471(**)	1.000	-.261(**)	-0.151	-0.041	-0.197	0.110	-0.111	-0.107
	0.918	0.141	0.179	0.750	0.931	0.000	0.000	0.000	.	0.009	0.138	0.691	0.052	0.282	0.276	0.295
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
SS_TOTAL	-0.064	0.038	-0.046	-0.068	0.016	-.419(**)	-.253(*)	-.499(**)	-.261(**)	1.000	0.038	0.100	.248(*)	-0.143	-0.092	0.123
	0.533	0.707	0.651	0.508	0.879	0.000	0.012	0.000	0.009	.	0.708	0.329	0.014	0.160	0.368	0.226
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
BHSTOTAL	-0.080	-0.120	-0.021	-0.019	0.007	-0.161	-0.132	-0.130	-0.151	0.038	1.000	.355(**)	.429(**)	0.151	-0.078	0.142
	0.431	0.238	0.835	0.856	0.944	0.114	0.196	0.201	0.138	0.708	.	0.000	0.000	0.139	0.447	0.163
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
HADSA_2	0.145	-0.129	0.051	-0.099	.351(**)	-0.143	-0.079	-.209(*)	-0.041	0.100	.355(**)	1.000	.401(**)	-0.122	-0.016	0.040
	0.155	0.207	0.620	0.333	0.000	0.160	0.437	0.039	0.691	0.329	0.000	.	0.000	0.230	0.876	0.695
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
HADSD_2	0.003	0.000	-0.055	-0.085	0.142	-.262(**)	-0.128	-.295(**)	-0.197	.248(*)	.429(**)	.401(**)	1.000	-0.011	0.027	0.122
	0.979	0.997	0.593	0.406	0.163	0.009	0.210	0.003	0.052	0.014	0.000	0.000	.	0.913	0.789	0.230
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
SP_ADJUSTED	-0.171	-0.074	-0.178	-0.026	-0.187	0.152	0.103	0.155	0.110	-0.143	0.151	-0.122	-0.011	1.000	0.124	-0.107
	0.092	0.468	0.079	0.802	0.065	0.134	0.311	0.128	0.282	0.160	0.139	0.230	0.913	.	0.225	0.294
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
RO_ADJUSTED	-0.137	0.135	-0.118	-0.172	0.109	-0.080	-0.077	0.011	-0.111	-0.092	-0.078	-0.016	0.027	0.124	1.000	0.075
	0.179	0.186	0.248	0.091	0.285	0.431	0.448	0.913	0.276	0.368	0.447	0.876	0.789	0.225	.	0.464
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98
NPC_ADJUSTED	0.062	0.072	0.164	-0.088	0.005	-0.187	-.308(**)	-0.058	-0.107	0.123	0.142	0.040	0.122	-0.107	0.075	1.000
	0.542	0.479	0.107	0.391	0.965	0.066	0.002	0.567	0.295	0.226	0.163	0.695	0.230	0.294	0.464	.
	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98

Table 25: Path Analysis Standardised Solution and R-Squared for hypothesised and final model for females (merged samples)

Standardised coefficients								Error		R-Squared
DSH_PAST=V2	=	-.061*F2	+	.232*F3	-	.841*F4				
	+	.482*F1	+	.000 E2		1.000				
BIS_TOTA=V3	=	.335*F4	+	.942 E3		.112				
BAS_TOTA=V4	=	.826 F2	+	.564 E4		.682				
SS_TOTAL=V5	=	-.445*F2	+	.896 E5		.198				
BHSTOTAL=V6	=	.726*F1	+	.688 E6		.527				
HADSA_2 =V7	=	.692*F1	+	.722 E7		.479				
HADSD_2 =V8	=	.623 F1	+	.783 E8		.388				
SP_ADJUS=V9	=	.810*F3	+	.586 E9		.656				
RO_ADJUS=V10	=	.327 F3	+	.945 E10		.107				
NPC_ADJU=V11	=	.373 F4	+	.928 E11		.139				
F2 =F2	=	-.267*F1	+	.964 D5		.071				
F3 =F3	=	-.185*F1	+	.983 D3		.034				
F4 =F4	=	.851*F1	+	.524 D4		.725				

* signifies free parameters; V = variable; F = factor; E = (residual) error term of measured variable; D = (disturbance) error term of latent variable

Table 26: Path Analysis Standardised Solution and R-Squared for hypothesised model for males (merged samples)

Standardised coefficients								Error		R-Squared
DSH_PAST=V2	=	.255*F2	+	.223*F3	+	.137*F4				
	+	.214*F1	+	.966 E2		.067				
BIS_TOTA=V3	=	1.000*F4	+	.000 E3		1.000				
BAS_TOTA=V4	=	.475 F2	+	.880 E4		.226				
SS_TOTAL=V5	=	-.106*F2	+	.994 E5		.011				
BHSTOTAL=V6	=	.905*F1	+	.425 E6		.819				
HADSA_2 =V7	=	.520*F1	+	.854 E7		.270				
HADSD_2 =V8	=	.614 F1	+	.789 E8		.377				
SP_ADJUS=V9	=	1.000*F3	+	.000 E9		1.000				
RO_ADJUS=V10	=	.203 F3	+	.979 E10		.041				
NPC_ADJU=V11	=	.088 F4	+	.996 E11		.008				
F2 =F2	=	-1.000*F1	+	.000 D5		1.000				
F3 =F3	=	-.023*F1	+	1.000 D3		.001				
F4 =F4	=	.479*F1	+	.952 D4		.095				

* signifies free parameters; V = variable; F = factor; E = (residual) error term of measured variable; D = (disturbance) error term of latent variable

Table 27: Path Analysis Standardised Solution and R-Squared for final model for males (merged samples), without path between maladaptive coping and impulsivity

Standardised coefficients				Error		R-Squared
DSH_PAST=V2	=	.216*V9	-	.339*F2	-	.182*F1
	+	.929 E2				.137
BIS_TOTA=V3	=	1.000*F4	+	.000 E3		1.000
BAS_TOTA=V4	=	1.000 F2	+	.000 E4		1.000
SS_TOTAL=V5	=	-.399*F2	+	.917 E5		.159
BHSTOTAL=V6	=	.912*F1	+	.410 E6		.832
HADSA_2 =V7	=	.518*F1	+	.856 E7		.268
HADSD_2 =V8	=	.613 F1	+	.790 E8		.375
SP_ADJUS=V9	=	-.022*F1	+	1.000 E9		.000
RO_ADJUS=V10	=	.226*F4	+	.974 E10		.051
NPC_ADJU=V11	=	.088 F4	+	.996 E11		.008
F2 =F2	=	-.470*F1	+	.883 D2		.221

* signifies free parameters; V = variable; F = factor; E = (residual) error term of measured variable; D = (disturbance) error term of latent variable

Table 28: Path Analysis Standardised Solution and R-Squared for final model for males (merged samples)

Standardised coefficients				Error		R-Squared	
DSH_PAST=V2	=	.225*V9	-	.789*F2	-	.645*F1	
	+	.000 E2				1.000	
BIS_TOTA=V3	=	1.000*F4	+	.000 E3		1.000	
BAS_TOTA=V4	=	.549 F2	+	.836 E4		.301	
SS_TOTAL=V5	=	-.176*F2	+	.984 E5		.031	
BHSTOTAL=V6	=	.916*F1	+	.401 E6		.839	
HADSA_2 =V7	=	-.473*F2	+	.881 E7		.224	
HADSD_2 =V8	=	.605 F1	+	.796 E8		.366	
SP_ADJUS=V9	=	-.021*F1	+	1.000 E9		.000	
RO_ADJUS=V10	=	.226*F4	+	.974 E10		.051	
NPC_ADJU=V11	=	.088 F4	+	.996 E11		.008	
F2 =F2	=	-.053*F4	-	.921*F1	+	.346 D2	.881
F4 =F4	=	.300*F1	+	.954 D4		.090	

* signifies free parameters; V = variable; F = factor; E = (residual) error term of measured variable; D = (disturbance) error term of latent variable